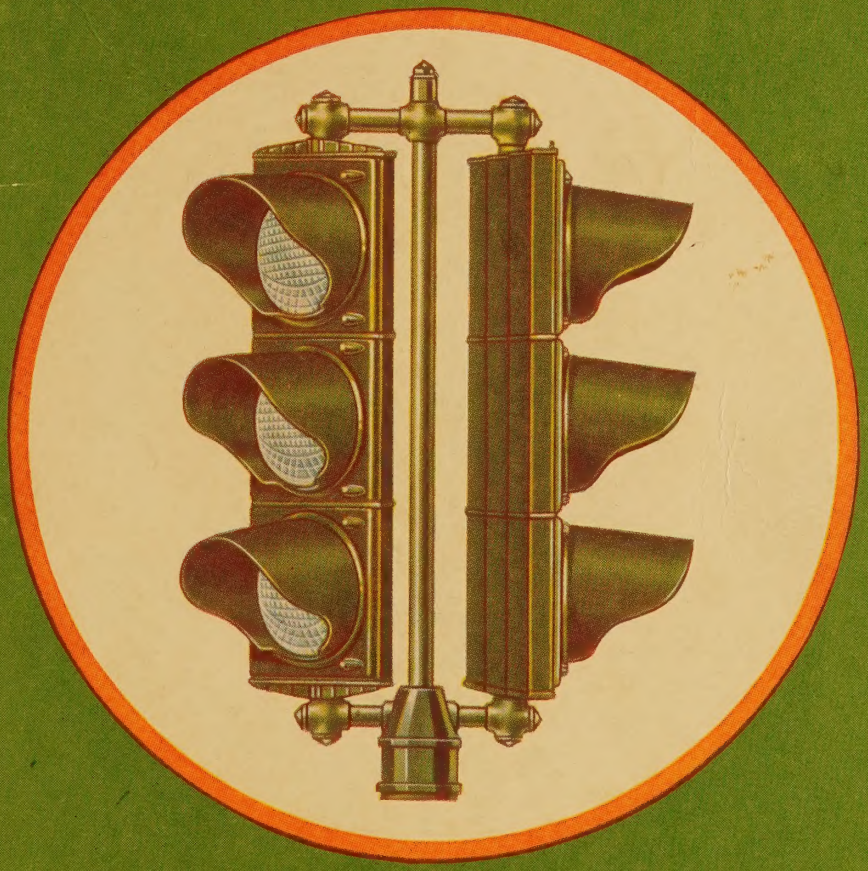
TRAFFIC SIGNALS *and* CONTROLS



CROUSE-HINDS

14-9

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REC'D JUN 2 8 1943

CROUSE-HINDS

IMPORTANT NOTICE

This catalog is registered in the name of:—

Name: Mr. Clarence Beach

Firm Name:

Street: Room 1004, Security Mutual Building

City: Binghamton

State: New York

We would like to keep this catalog up-to-date. Therefore, please notify us immediately of any change in address or ownership.

CROUSE-HINDS COMPANY,

Syracuse, New York.

CROUSE-HINDS

TRAFFIC SIGNALS

SCHEDULE "T"

No. RT-23

TRADE DISCOUNT SHEET

Dated and Effective, August 1, 1941

		Discount Schedule T	Multiplier
Discount	In any quantity	15%	.85

Terms

Note 1. Terms apply from date of invoice.

Note 2. **Net 30 days with no cash discount for prepayment.**

When specifications definitely call for a cash discount, the price should be increased by the amount of the discount.

Example: If a cash discount of 3% is required, divide the net selling price by 0.97 to obtain the selling price subject to 3% cash discount for payment in less than 30 days from date of invoice.

Sales Taxes

Note 3. Sales taxes and use taxes shall be added to the selling prices and be paid by the purchaser as a separate item.

Delivery

Note 4. Traffic Signals are sold f. o. b. common carrier, Syracuse, New York, with freight prepaid to any regular freight station on a common carrier in the United States.

Express Shipments

Note 5. Traffic Signal equipment ordered by express will be forwarded with transportation charges prepaid. To the net price of the equipment so ordered there will be added a net amount representing the difference between the express and freight transportation charges.

Routing

Note 6. Crouse-Hinds Company will use its own discretion in routing all shipments upon which it assumes transportation charges. Shipments will be made in any manner requested by the customer, if the customer will assume the extra transportation costs.

Cartage

Note 7. Crouse-Hinds will not assume, allow, or pay any charges for cartage at destination.

List prices and discounts subject to change without notice.

CROUSE-HINDS COMPANY

ESTABLISHED 1897

SYRACUSE, N. Y., U. S. A.

Sales Offices

BIRMINGHAM, BOSTON, CHICAGO, CINCINNATI, CLEVELAND, DALLAS, DETROIT, HOUSTON, KANSAS CITY, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, NEW YORK, PHILADELPHIA, PITTSBURGH, SAN FRANCISCO, SEATTLE, ST. LOUIS, WASHINGTON

Resident Salesmen

ALBANY, ATLANTA, BALTIMORE, BUFFALO, CHARLOTTE, DENVER, LOUISVILLE, NEW ORLEANS

(See other side)

CROUSE-HINDS

POLES FOR TRAFFIC SIGNALS

No. RT-23 SCHEDULE "P"

Dated and Effective, August 1, 1941

		Discount Schedule P	Multiplier
Discount	In any quantity	55%	.45

Terms

Note 1. Terms apply from date of invoice.

Note 2. Net 30 days with no cash discount for prepayment.
When specifications definitely call for a cash discount, the price should be increased by the amount of the discount.
Example: If a cash discount of 3% is required, divide the net selling price by 0.97 to obtain the selling price subject to 3% cash discount for payment in less than 30 days from date of invoice.

Sales Taxes

Note 3. Sales taxes and use taxes shall be added to the selling prices and be paid by the purchaser as a separate item.

Delivery

Note 4. Poles for Traffic Signals are sold f. o. b. common carrier, in the city where manufactured, with freight prepaid to any regular freight station on a common carrier in the United States. Orders for repair parts only will be shipped collect. No transportation allowance will be made.

Freight Charges

Note 5. Zone 1. No charge will be made to cover delivery by freight on shipments into Zone 1.

Note 6. Zone 2. An amount equal to 4% of the list value of the shipment will be added as a net amount to the face value of the invoice to cover transportation charges.

Note 7. Zone 3. An amount equal to 8% of the list value of the shipment will be added as a net amount to the face value of the invoice to cover transportation charges.

Example

Note 8.

One (1) Pole Design No. 7504—List Price $74.60 less 55%	$33.57
Add for Zone 2 freight charges 4% of $74.60	2.98
Total Price delivered in Zone 2	$36.55

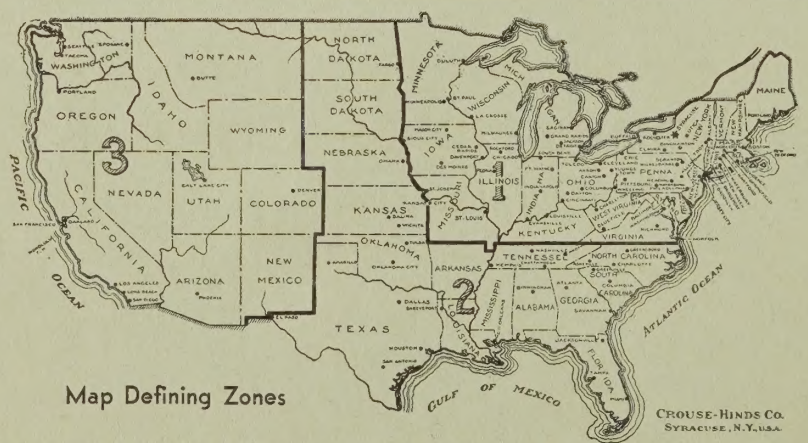
Express Shipments

Note 9. Poles ordered by express will be forwarded with transportation charges prepaid. To the net delivered price of the equipment so ordered there will be added a net amount representing the difference between the actual express and actual freight transportation charges.

Routing

Note 10. Crouse-Hinds Company will use its own discretion in routing all shipments upon which it assumes transportation charges. Shipments will be made in any manner requested by the customer, if the customer will assume the extra transportation costs.

List prices and discounts subject to change without notice.



Map Defining Zones

CROUSE-HINDS CO.
SYRACUSE, N.Y., U.S.A.

(See other side)

CROUSE-HINDS

TRAFFIC SIGNALS AND CONTROLS

Catalog 226

(Supersedes Previous Listings)

(NOTE: Dimensions and weights in this Catalog are not guaranteed. They have been compiled with care, in most cases to the nearest eighth of an inch or pound, and are sufficiently accurate for most purposes. Dimensions and weights are subject to change without notice.)

CROUSE-HINDS COMPANY

ESTABLISHED 1897

SYRACUSE, N. Y., U. S. A.

Sales Offices

BIRMINGHAM — BOSTON — CHICAGO — CINCINNATI — CLEVELAND — DALLAS — DETROIT — HOUSTON — KANSAS CITY
LOS ANGELES — MILWAUKEE — MINNEAPOLIS — NEW YORK — PHILADELPHIA — PITTSBURGH
SAN FRANCISCO — SEATTLE — ST. LOUIS — WASHINGTON

Resident Salesmen

ALBANY — ATLANTA — BALTIMORE — BUFFALO — CHARLOTTE — DENVER — LOUISVILLE — NEW ORLEANS

Crouse-Hinds Company of Canada, Ltd.

Main Office and Plant: TORONTO, ONT.

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Printed in U.S.A.

Installation of Crouse-Hinds Traffic Signals

Installation of Crouse-Hinds Traffic Signals

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Fig. 1
Front View

Design

The Crouse-Hinds Company is offering a complete line of newly designed traffic signals, which is in keeping with the trend of modern design. The four illustrations on this page show the artistic lines of the signal. The modern straight line motif is carried out in the entire design. Hinges and catches are concealed, and as a result, the signal presents an excellent appearance when viewed from any angle.

Every detail of design has been carefully considered, not only from an artistic standpoint, but also for its efficiency and durability. Particular care has been given to the optical system, with the result that the light output or strength of signal indication is much greater than that of competitive signals.

Materials

The casing, door and hood are made of a special silicon aluminum alloy, cast in steel dies under tons of pressure. Such construction insures a uniform and homogeneous casting of great strength, capable of resisting corrosive atmospheres, including salt air. Castings are extremely accurate and all joints fit to a few thousandths of an inch. Similar parts are interchangeable on all signals.

The red, amber, and green lenses are selected especially for purity of color and high transmission. The outer surface of the lens is smooth, which makes cleaning easy, while on the inner surface there are prisms for distributing the light downward and to the sides. Each part is designed for its particular purpose and only the very finest materials are used.

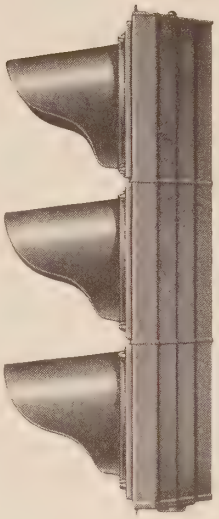


Fig. 2
Side View

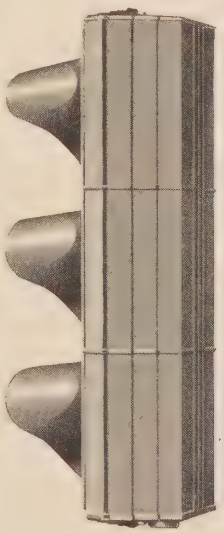


Fig. 3
¾ Rear View

Body Construction

The bodies of the new Crouse-Hinds signal are of unit, sectional construction—an individual body casting being used for each optical system. These individual bodies are securely clamped between ornamental end plates by means of ⅜-inch through bolts, thus insuring a rigid, compact casing which is dust and watertight. Signals of two, three, four, or five sections may be built up as desired.

This unit construction, with complete interchangeability of parts, is of great benefit to cities using any quantity of signals, since any desired combination and arrangement of signal bodies can be made up locally. In case of damage, there is considerably more salvage with this unit, of sectional construction, than with any other type. Door and hood are cast in one piece, which saves assembly on the job. Doors with separate hoods of sheet aluminum can be furnished on special order.

After assembly, the complete body is finished with two coats of baked enamel, thus affording additional protection against the weather.

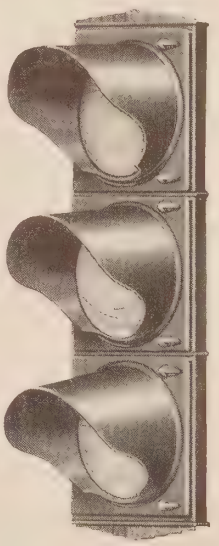


Fig. 4
¾ Front View

CROUSE-HINDS

Crouse-Hinds Traffic Signals

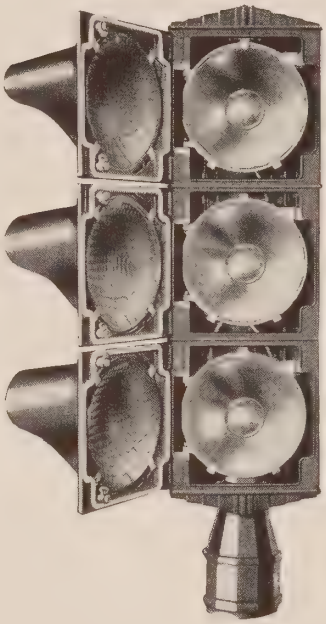


Fig. 5
Type TSP-113D One-Way Signal
Doors Open showing Interior

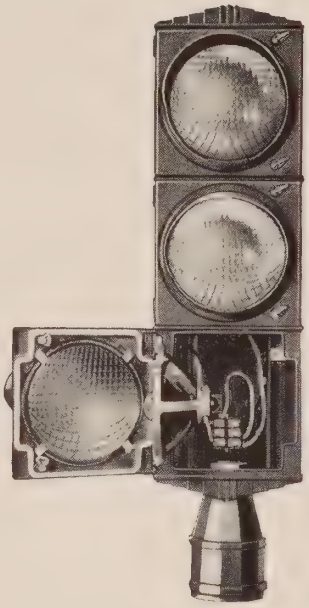


Fig. 6
Type TSP-113D One-Way Signal
Door Open and Reflector Swung Out
Showing Terminal Block

Reflector Assembly•

The reflector used in the new Crouse-Hinds signal is an extremely accurate, parabolic reflector made of polished glass, silvered to form the reflecting surface, which in turn is protected by a heavy layer of electrolytically-deposited copper. Over this copper are placed the protective backings which completely seal the reflecting surface.

Instead of glass reflectors, the Crouse-Hinds Company is prepared to furnish high-efficiency Alzak finish aluminum reflectors at no increase in cost. These Alzak reflectors are lighter in weight than glass reflectors and are not subject to breakage. The reflectors used in Crouse-Hinds signals are the finest and most efficient available. They are fully guaranteed.

The reflector is mounted in a spider which also holds the lamp receptacle, and is hinged to the casing. The lamp receptacle is adjustable so that lamps of varying light center lengths may be used. The receptacle is equipped with a lamp grip to prevent the lamps from loosening due to vibration. When shipped from the factory, the receptacle is correctly positioned for the standard 60-watt traffic signal lamp which has a light center length of $2\frac{7}{16}$ inches.

When in the normal position, the reflector assembly is rigidly fastened to the casing and does not have to be disturbed for relamping. This eliminates breakage due to repeated handling. When access to the rear is wanted, it is only necessary to loosen the single catch and swing the reflector outward on its hinges. No tools are necessary.

The lamp receptacles are equipped with wires having colored, coded braids, which greatly simplifies installation. The following code is used on all one-way bodies:

Lens	Hot Wire	Neutral Wire
Red	Red braid	White braid with red tracer
Amber	Yellow braid	White braid with yellow tracer
Green	Green braid	White braid with green tracer
Arrow	Blue braid	White braid with blue tracer
Walk	Blue braid	White braid with blue tracer

Terminal Block

The lead wires from the lamp receptacles are fastened to a moulded composition terminal block which is mounted on the rear wall of the casing. For underground feed, the terminal block is in the bottom, and for overhead feed, in the top. This terminal block is provided with separate screws for field wires. Screws are #12–24 with large binding heads.

The terminals to which field wires must be attached are identified to facilitate field work.

•Denotes change in information.

CROUSE-HINDS

Crouse-Hinds Traffic Signals

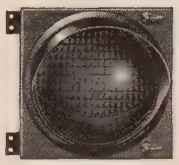


Fig. 1
Standard Door and Hood

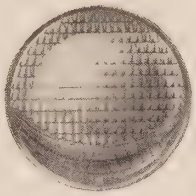


Fig. 2
Standard Unlettered
Combination Lens

Fig. 3●
Standard A. S. A. Arrow Lens
Right, Left, or Straight Through

Door and Hood

Standard Door and Hood: The door and hood are cast in one piece, which not only eliminates assembly on the job, but also prevents light leakage between the two. The hood is 7½ inches long and tips downward 8°.

The hood encompasses 300° of the lens, and is shaped to give a full view of the lens from any angle. It is cut away at the bottom to prevent any accumulation of snow.

The door is supported by two concealed hinges on the left side and is securely locked in place by two cam catches on the right. Hinges and catches are in the corners, thus providing for equal gasket pressure and making the joint dust and watertight.

Fig. 4
Extra Long Sheet Aluminum Hood

Special Hoods: Catalog numbers and prices given in this Catalog include the standard door with hood attached. However, for extraordinary conditions, hoods of special shape and length can be furnished. These are listed in section 608, page 10.

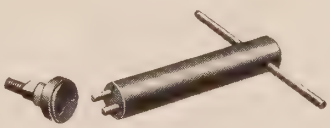


Fig. 5
Special Locking Catch and Wrench

Special Locking Catch and Wrench: Doors are opened by a quarter-turn of the cam catches, illustrated in Fig. 1. However, if the order so states, catches which can only be opened with a special wrench may be supplied. This catch and wrench are illustrated in Fig. 5.

Lenses

The lenses which are used in Crouse-Hinds signals are standard combination lenses, 8⅜ inches in diameter. This lens has a special combination of directing and diffusing prisms which direct the light slightly downward and to the sides and gives a very high candlepower in the center of the beam, thus insuring a bright and positive signal indication under all conditions. The lower portion of the lens has a special crescent-shaped set of prisms, which diffuses the light to the side for greater pedestrian visibility. All lenses used in Crouse-Hinds signals are made of the finest optical glass, true to color and of high transmission. They are thoroughly annealed and tested before shipment, and are fully guaranteed against breakage due to heat of the lamp.

The unlettered combination lens is standard and is furnished on all signals listed in this Catalog, unless special lenses are ordered.

Fig. 6
"WALK" Lens

Fig. 7
"ALTO" Lens

Lettered lenses reading: "STOP," "CAUTION," "GO," "WALK," "WAIT," "PED'N," "LEFT TURN," as well as right and left arrows, can be furnished.

For Spanish speaking countries, lenses reading "SIGA" and "ALTO" can also be furnished.

Lenses are listed separately in section 608, pages 1 and 2.

●Denotes change in illustration.

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Fig. 8
Type TSP-113D One-Way Signal
4-Inch Post Mounting
Underground Feed

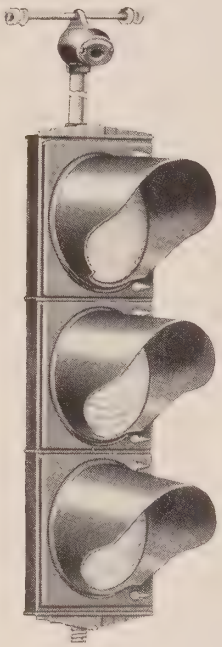


Fig. 9
Type TSU-113D One-Way Signal
1½-Inch Nipple Mounting
Overhead Feed

Fig. 10
Type TSW-113D One-Way Signal
Span-Wire Mounting

Fig. 11
Type TSM-113D One-Way Signal
Mast-Arm Mounting

Mountings

Post Mounting: For mounting on top of an ornamental pole or post, the Crouse-Hinds signals are furnished with a fitter which slips over a 4-inch inside diameter pipe, having an outside diameter of 4½ inches. This fitter is designed particularly to take 4-inch tenon used on ornamental traffic signal poles, the tenon being 4½ inches in diameter and 4 inches high.

The lines of the slip fitter blend artistically with the signal housing. It is rugged and durable and is securely fastened to the signal housing.

This slip fitter is held to the pole or tenon by four ⅜-inch diameter headless set screws. Post mounting is illustrated in Fig. 8.

Nipple Mounting: Some ornamental traffic signal poles are tapped at the top of the pole to receive a 1½-inch pipe nipple and to meet this condition, the bottom of the signal is equipped with a 1½-inch pipe nipple, which is securely fastened to the signal housing and which, in turn, may be screwed into the top of the pole. To facilitate assembly the nipple may be removed from the signal, screwed into the top of the pole, and the signal slipped over the nipple and locked in place by a check nut on the inside of the housing. This mounting is illustrated in Fig. 9.

•**Span-Wire Mounting:** For attaching to a span wire, a span-wire clamp to fasten to a ¼ to 7/16-inch messenger wire is used. This clamp is made of malleable iron with hot-dipped galvanized finish, and is equipped with two "J" bolts, which fasten it securely to the span wire. A special cast bronze wire outlet with composition cover and universal joint is provided. This bronze wire outlet is large and roomy to make easy the attaching of field wires to the terminal block in the top of the signal. This mounting is illustrated in Fig. 10.

Mast-Arm Mounting: For mast-arm mounting, there is provided a cast bronze fitting which slips directly over a 2-inch pipe mast arm. This casting is equipped with ears, making it possible to use one, two or three guy rods, depending upon the length of the mast arm. The fitter is fastened to the mast arm by means of two ⅜-inch set screws. A cast bronze wire outlet with composition cover and universal joint is provided between the mast-arm fitter and the signal.

Such construction means that, while the signal is securely fastened to the mast arm, it is free to swing with the wind and thus relieve the mast arm of all torsional strains. This mounting is illustrated in Fig. 11.

•Denotes change in information.

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Fig. 1
Type TSV-113D One-Way Signal
Vertical Bracket-Arm Mounting
Without Wire Outlet

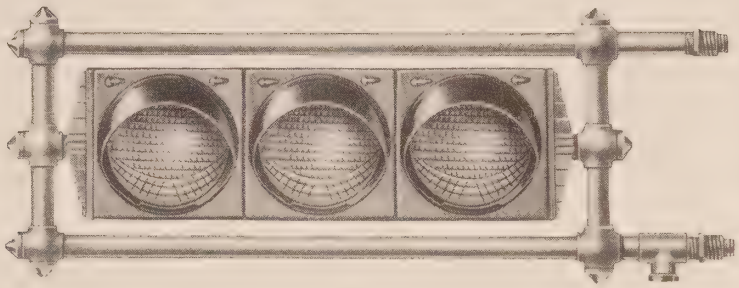


Fig. 2•
Type TSH-113D One-Way Signal
Horizontal Bracket-Arm Mounting
With Wire Outlet in Lower Arm

•**Note:** Signals are regularly furnished without wire outlet. If desired, a wire outlet fitting will be placed in either the lower or upper arm of both types of bracket-arm mounting. Unless otherwise specified, the wire outlet will be placed in the lower arm.

Vertical Bracket-Arm Mounting: For mounting the signals vertically and attaching them to the side of a pole or structure, the signal is furnished with 1¼-inch bracket arms and to these arms standard pole clamps or flanges may be attached. The standard bracket arm is 10 inches long, which places the center line of the signal 13⅜ inches from the outside of the pole upon which it is mounted. Due to the extreme light weight of the signal, 1¼-inch bracket arms are used. This mounting is illustrated in Fig. 1.

Horizontal Bracket-Arm Mounting: For mounting the signals in a horizontal position, with the red lens at the left and the green at the right and attached to a pole or other vertical support, the signal is furnished with a set of 1¼-inch diameter pipe arms to which the pole clamps or flanges may be attached. The standard length bracket arm is 43 inches, which places the outside edge of the signal 50⅜ inches from the pole. This mounting is illustrated in Fig. 2.

Lens Arrangement

The Crouse-Hinds Company pioneered the present standard arrangement of signal lenses, placing them in the following order:

Vertical Signal	Horizontal Signal
Top—Red	Outside—Red
Center—Amber	Center—Amber
Bottom—Green	Inside—Green

This uniformity of lens position is of great benefit to color-blind persons, since it enables them to read the signal indication correctly by its position in the housing.

With the advent of lenses having arrows to indicate particular traffic movements, the positions of the arrow lenses are standardized. The one or more arrow lenses are placed immediately below the green lens, in the following order: straight-through arrow, right-turn arrow, and left-turn arrow.

In some signal systems special signal indications are used to control pedestrians. The preferred method is a separate lens showing the word "WALK." When this lens is used, it is placed below all arrow lenses. If no arrow lenses are used, the "WALK" lens is placed below the green lens.

The standard lens for pedestrians shows the word "WALK" in clear letters on a black background.

•Denotes change in illustration or addition of note.

CROUSE-HINDS

Crouse-Hinds Traffic Signals

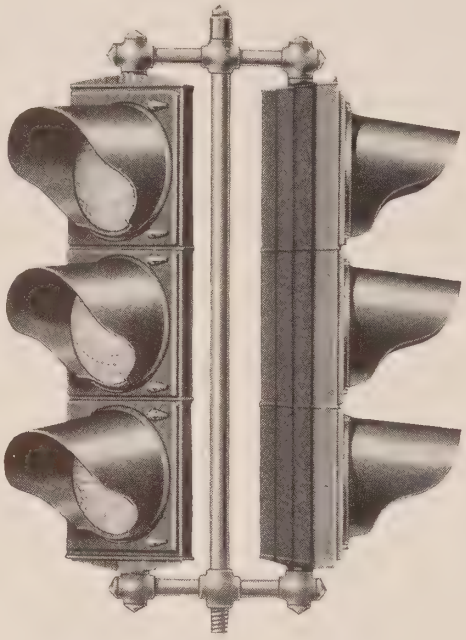


Fig. 3
Type TRU-223D
Two-Way Adjustable Signal
1½-Inch Nipple Mounting

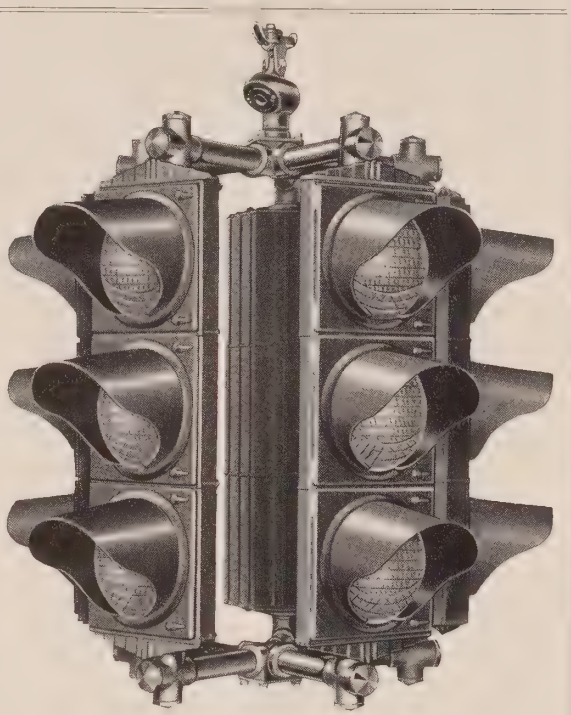


Fig. 4
Type TRW-553D
Five-Way Adjustable Signal
Span-Wire Mounting

The one-way signal bodies illustrated and described on the previous pages are grouped on suitable arms to form two, three, four, five, and six-way adjustable signals, which are listed on pages 11 to 16 of this section. Signals having two, three, and four sections or lenses per face, are listed; but any desired number of lenses per face can be furnished on special order.

These adjustable signals are especially advantageous for use at irregular intersections. Each body may be separately rotated about its own axis, or points of suspension, so that it may be aimed in any desired direction, thus placing the several indications directly in line with the streams of traffic which they control.

The individual one-way signals are attached to arms of suitable lengths to permit free rotation of the bodies without interference, so that they may be aimed in any desired direction. The attachment fittings are of malleable iron or brass and the arms are of standard wrought iron pipe.

The individual signals are fastened to the supports with nipples and check nuts, and after the bodies have been properly aimed, they are securely locked in place. Should one of the signals become damaged it may be removed from the assembly without disturbing the other signals.

To meet the various requirements for installation, the adjustable signals are listed in this Catalog, section 601, pages 11 to 16, for span-wire, mast-arm, vertical bracket-arm, 4-inch slip-fitter, 1½-inch nipple, and pedestal mountings.

Fig. 5
Type TRA-553D
Five-Way Adjustable Signal
Pedestal Mounting

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Specifications

Casing: The casing of the one-way signal is made of silicon aluminum, cast in steel dies. It is of sectional construction with the individual sections held between the top and bottom plates by two rods with ornamental acorn nuts and lock washers. Two, three, four, five, and six-way adjustable signals consist of an assembly of the one-way signal, attached to suitable arm supports.

Door and Hood: The standard door and hood are made of the same material, and are cast as a unit. The hood is 7½ inches long, tips downward 8°, and embraces 300° of the lens. Special hoods of sheet aluminum may be obtained to meet special conditions. Doors are hinged at the left and securely fastened on the right by two cam-acting lever catches.

Theft-Proof Catch: If specified on the order, doors may be equipped with special theft-proof catches instead of the standard cam-acting lever catches. This catch can only be opened with a special wrench supplied with each order of signals.

Reflector: Signals are equipped with a separate glass reflector for each signal indication. Reflectors are extremely accurate polished glass mirror reflectors, protected with electrolytically-deposited copper and baked enamel. They are fully guaranteed. Reflectors are mounted in a spider casting which also holds the lamp receptacle. This reflector assembly is hinged to the casing and is locked in position by a single screw.

Lamp Receptacle: Lamp receptacles are of the weatherproof type, made of moulded composition and are equipped with wires having colored, coded identifying braids. The receptacle has a lamp grip, which will prevent the lamps from loosening, due to vibration.

Lenses: Signals are equipped with the Crouse-Hinds standard, unlettered combination lens which not only produces a very bright signal indication for distant observation, but also distributes the light downward and to the sides, thus insuring perfect visibility to both vehicle drivers and pedestrians. Lenses lettered with the words "STOP," "CAUTION," "GO," "WALK," etc., or arrow lenses may be substituted for the unlettered lenses at an advance in the list prices as given on the listing pages.

The red, amber, and green lenses conform to the American Standard Colors for Traffic Signals, as approved by the American Standards Association.

Lamps: Signals are designed to take the standard 60-watt traffic signal lamp mounted in an A-21 clear bulb. Traffic signal lamps of 25, 40, or 100-watt sizes may also be used. For base lights, where the lamp is burned base up, the 50-watt limited lighting service lamp in a P-19 clear bulb is recommended.

Wiring: Each signal body is wired complete ready for installation. The lead wires from the weatherproof lamp receptacles are extended to a terminal block mounted on the rear wall of the housing. For underground feed, the terminal block is in the bottom and for overhead feed, it is in the top. Separate terminals for all field wires are provided.

Post-Type Mounting: The post-type signal is equipped with a fitter which slips down over standard 4-inch (I. D.) pipe and is held in place by means of set screws. This signal can be arranged for either overhead or underground feed. The type of feed desired should be specified on the order.

Nipple Mounting: At the bottom of this signal there is securely fastened a 1½-inch nipple for mounting on poles, equipped with a suitable nipple fitter. Two-inch nipple mounting can be furnished if specified.

Span-Wire Mounting: The span-wire signal is equipped with a universal joint and a suitable clamp for fastening to a steel span wire, and with a weatherhead and cover for the signal wires.

Mast-Arm Mounting: The mast-arm signal is equipped with a universal joint and a suitable attachment for fastening on the end of a 2-inch mast arm, and with weatherheads and covers where the wires enter the signal and the mast-arm fitter.

Bracket-Arm Mounting: The bracket-arm signal is furnished complete with bracket arms for either horizontal or vertical mounting. Catalog numbers and prices do not include pole clamps. They are listed separately in section 608, page 5.

Bracket-Arm Mounting With Fuse Compartment: The fuse compartment, which also serves as a bracket arm, is large enough to take standard plug or cartridge fuses for each of the signal wires, or, if desired, a terminal block may be placed in this housing.

Finish: Signals are finished with two coats of enamel, each coat being separately baked; thus insuring a permanent, durable finish. The standard color is green, but any desired color may be furnished without extra charge. In case a special color is wanted, a sample of the desired color should be submitted.

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Type Letters and Numbers

Each Crouse-Hinds traffic signal is designated by type letters and numbers which are descriptive of the signal. These type letters and numbers as well as the catalog number should be given on all orders for signals.

First Letters

TS = 1, 2, 3, or 4-Way Non-Adjustable Signal without Base Light.
TI = 1, 2, 3, or 4-Way Non-Adjustable Signal with Base Light.
TR = 2, 3, 4, 5, or 6-Way Adjustable Signal without Base Light.
TIR = 2, 3, 4, 5, or 6-Way Adjustable Signal with Base Light.
TT = 2-Way Tandem Adjustable Signal without Base Light.

Last Letter

•O = Without any Mounting Attachments.
W = Suspended Signal with Span-Wire Hanger and Wire Outlet.
M = Suspended Signal with Mast-Arm Hanger and Wire Outlet.
V = Vertically-Mounted Signal with Bracket Arms.
H = Horizontally-Mounted Signal with Bracket Arms.
B = Horizontally-Mounted Signal with Compartment for Fuse Block or Cable Splicing.
P = Post-Top Signal with Slip Fitter for Mounting on Pipe or Pole Top, 4 inches inside diameter, and 4½ inches outside diameter.
U = Post-Top Signal for Mounting on 1½-Inch Pipe Nipple.
A = 4-Leg Pedestal Signal with Base Compartment for Control Switch. All such signals are equipped with a Base Light.
•E = Extra One-Section Signal for Mounting beneath Existing Signal. Includes Nipple Gaskets and Check Nuts.
•T = One-Way Signal with Reflector for Lighting Information Sign.
•S = (Following W, M, P, etc.) Signal Equipped with Fire Siren.
•Y = Yoke Mounting for 4-Inch Pedestal.

First Numbers

11 = One-Way Signal.
22 = Two-Way Signal.
33 = Three-Way Signal.
44 = Four-Way Signal.
55 = Five-Way Signal.
66 = Six-Way Signal.

Last Number

1 = One-Section Signal.
2 = Two-Section Signal.
3 = Three-Section Signal.
4 = Four-Section Signal.

Letter Following the Final Figure

The letter "D" following the final figure designates the general type of all signals at present listed in this Catalog, as distinguished from the older types previously sold.

Note: There is no distinction in type letters or numbers between signals with overhead and underground feed. In the listing, the distinction is made in the following manner: The letters "UG" following the type numbers indicate that the particular signal is for underground feed and is equipped with a suitable attachment for the incoming wires. The letters "OH" following the type numbers indicate that the signal is for overhead feed.

•Denotes addition.

CROUSE-HINDS

Crouse-Hinds Traffic Signals

One-Way, Three-Section

Mounting Arrangements

Fig.1
Type TSP-113D One-Way Signal
4-Inch Post Mounting
Underground Feed

Fig. 2
Type TSP-113D One-Way Signal
4-Inch Post Mounting
Overhead Feed

Fig. 3
Type TSU-113D One-Way Signal
1½-Inch Nipple Mounting
Underground Feed

Fig. 4
Type TSU-113D One-Way Signal
1½-Inch Nipple Mounting
Overhead Feed

Fig. 5
Type TSV-113D One-Way Signal
Vertical Bracket-Arm Mounting
Without Wire Outlet

Fig. 6
Type TSV-113D One-Way Signal
Vertical Bracket-Arm Mounting
With Wire Outlet

Fig. 7
Type TSW-113D
One-Way Signal
Span-Wire Mounting

Fig. 8
Type TSM-113D
One-Way Signal
Mast-Arm Mounting

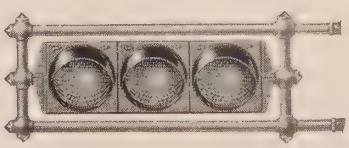


Fig. 9
Type TSH-113D One-Way Signal
Horizontal Bracket-Arm Mounting
Without Wire Outlet

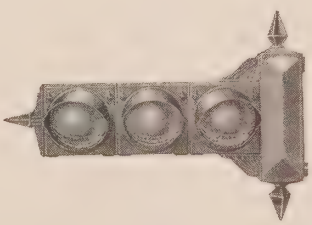


Fig. 10
Type TSB-113D One-Way Signal
Horizontal Mounting
With Fuse Compartment

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Two-Way, Three-Section, Adjustable

Mounting Arrangements

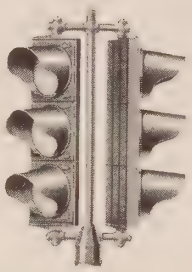


Fig. 11
Type TRP-223D Two-Way Signal
4-Inch Post Mounting
Underground Feed

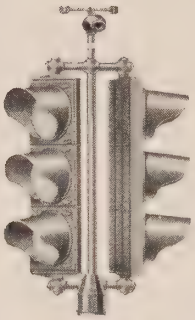


Fig. 12
Type TRP-223D Two-Way Signal
4-Inch Post Mounting
Overhead Feed

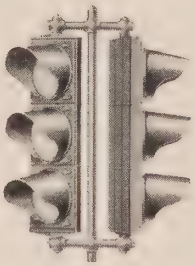


Fig. 13
Type TRU-223D Two-Way Signal
1 ½-Inch Nipple Mounting
Underground Feed

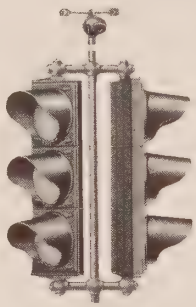


Fig. 14
Type TRU-223D Two-Way Signal
1 ½-Inch Nipple Mounting
Overhead Feed

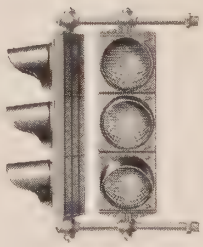


Fig. 15
Type TTV-223D Two-Way Signal
Tandem Bracket-Arm Mounting
Without Wire Outlet

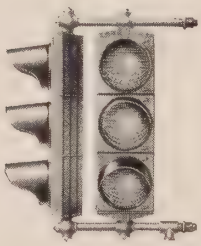


Fig. 16
Type TTV-223D Two-Way Signal
Tandem Bracket-Arm Mounting
With Wire Outlet

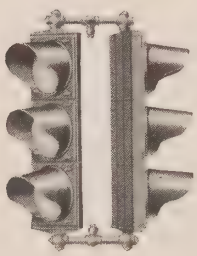


Fig. 17
Type TRV-223D Two-Way Signal
Vertical Bracket-Arm Mounting
Without Wire Outlet

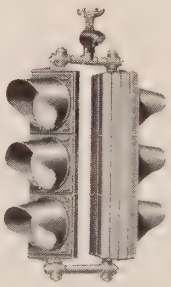


Fig. 18
Type TRW-223D Two-Way Signal
Span-Wire Mounting

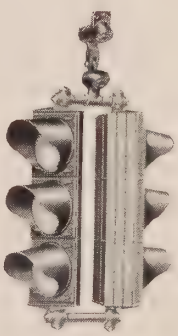


Fig. 19
Type TRM-223D Two-Way Signal
Mast-Arm Mounting

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Three and Four-Way, Three-Section, Adjustable

Mounting Arrangements

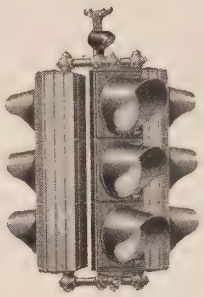


Fig. 1
Type TRW-333D
Three-Way Signal
Span-Wire Mounting

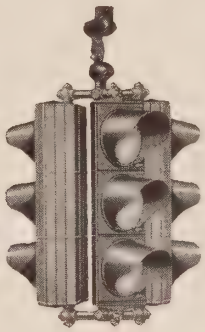


Fig. 2
Type TRM-333D
Three-Way Signal
Mast-Arm Mounting

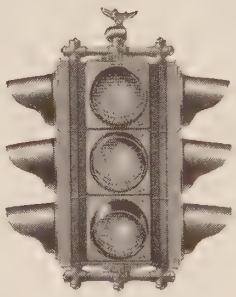


Fig. 3
Type TRW-443D
Four-Way Signal
Span-Wire Mounting

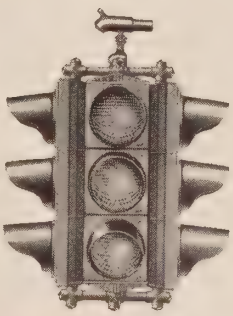


Fig. 4
Type TRM-443D Four-Way Signal
Mast-Arm Mounting

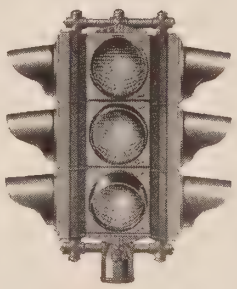


Fig. 5
Type TRP-443D Four-Way Signal
4-Inch Post Mounting
Underground Feed

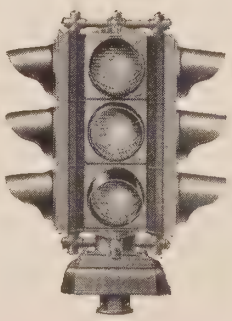


Fig. 6
Type TIRP-443D Four-Way Signal
With Base Light
4-Inch Post Mounting
Underground Feed

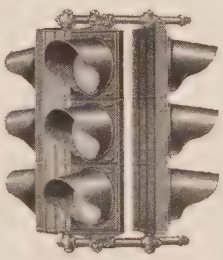


Fig. 7
Type TRV-333D
Three-Way Signal
Vertical Bracket-Arm Mounting
Without Wire Outlet

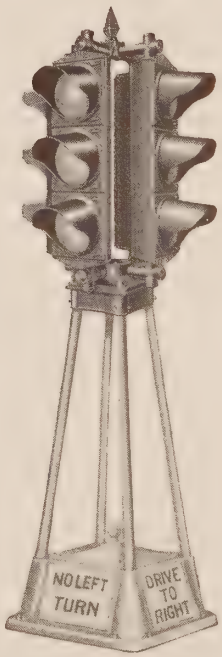


Fig. 8
Type TRA-443D
Four-Way Signal
With Base Light
Pedestal Mounting
Underground Feed

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Five and Six-Way, Three-Section, Adjustable

Mounting Arrangements

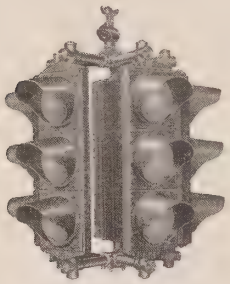


Fig. 9
Type TRW-553D Five-Way Signal
Span-Wire Mounting

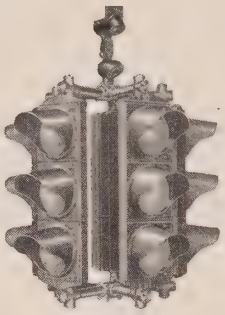


Fig. 10
Type TRM-553D Five-Way Signal
Mast-Arm Mounting

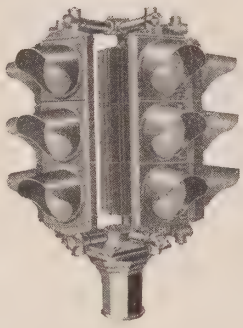


Fig. 11
Type TRP-553D Five-Way Signal
4-Inch Post Mounting
Underground Feed

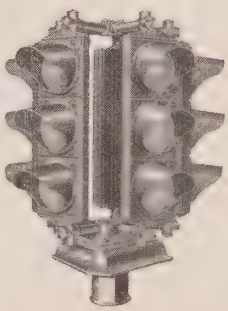


Fig. 12
Type TIRP-553D Five-Way Signal
With Base Light
4-Inch Post Mounting
Underground Feed

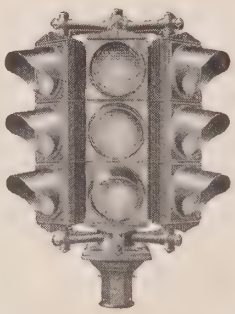


Fig. 13
Type TRP-663D Six-Way Signal
4-Inch Post Mounting
Underground Feed

Fig. 16
Type TRA-553D
Five-Way Signal
With Base Light
Pedestal Mounting
Underground Feed

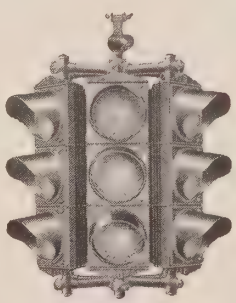


Fig. 14
Type TRW-663D Six-Way Signal
Span-Wire Mounting

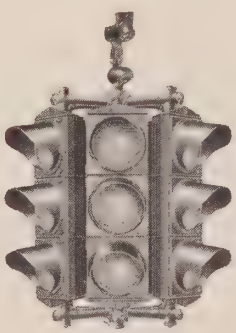


Fig. 15
Type TRM-663D Six-Way Signal
Mast-Arm Mounting

CROUSE-HINDS

One-Way Traffic Signals

Two, Three, and Four-Section

Fig. 1
Type TSP-112D One-Way Signal
4-Inch Post Mounting

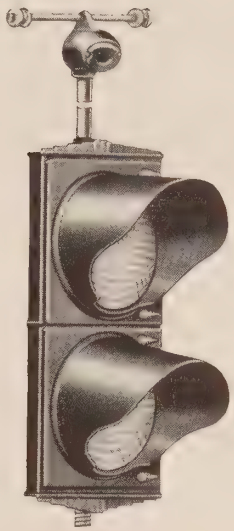


Fig. 2
Type TSU-112D One-Way Signal
1½-Inch Nipple Mounting
Overhead Feed

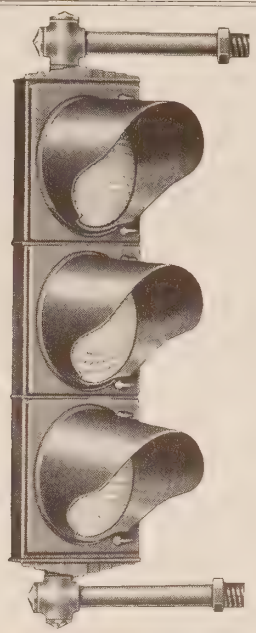


Fig. 3
Type TSV-113D One-Way Signal
Vertical Bracket-Arm Mounting

Fig. 4•
Type TSU-114D One-Way Signal
1½-Inch Nipple Mounting
Underground Feed

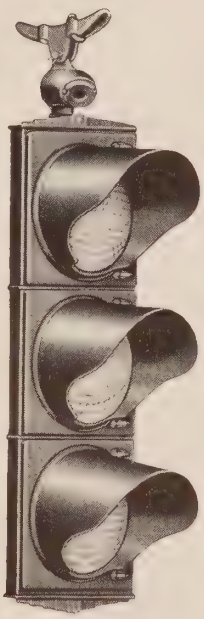


Fig. 5
Type TSW-113D One-Way Signal
Span-Wire Mounting

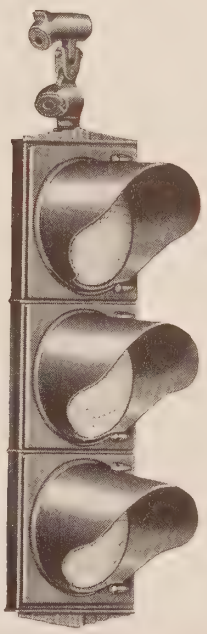


Fig. 6
Type TSM-113D One-Way Signal
Mast-Arm Mounting

•Denotes change in illustration.

CROUSE-HINDS

One-Way Traffic Signals

Two, Three, and Four-Section

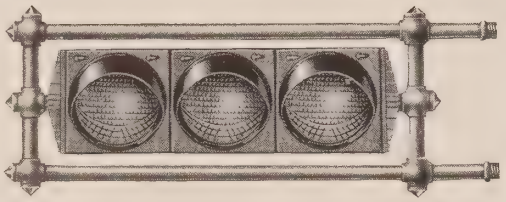


Fig. 7
Type TSH-113D One-Way Signal
Horizontal Bracket-Arm Mounting

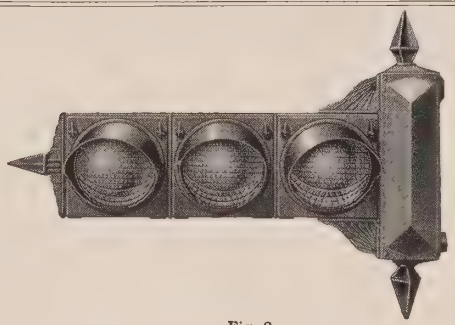


Fig. 8
Type TSB-113D One-Way Signal
With Fuse Compartment
Horizontal Mounting

Two-Section, One-Way Signals

With Red and Green Unlettered Combination Lenses‡

Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TSO-112D	Without any Mounting Attachments	18 lbs.	46403•	$32.00
TSW-112D	Span Wire	25 lbs.	42216	37.20
TSM-112D	Mast Arm	30 lbs.	42217	41.80
TSV-112D	Vertical-Bracket Arm, less Pole Clamps	28 lbs.	42222	38.00★
TSH-112D	Horizontal-Bracket Arm, less Pole Clamps	69 lbs.	42223	45.60★
TSP-112D UG	4-Inch Post, Underground Feed	28 lbs.	42218	38.20
TSP-112D OH	4-Inch Post, Overhead Feed	34 lbs.	42219	41.60
TSU-112D UG	1½-Inch Nipple, Underground Feed	19 lbs.	42220	33.80
TSU-112D OH	1½-Inch Nipple, Overhead Feed	25 lbs.	42221	37.20

Three-Section, One-Way Signals

With Red, Amber, and Green Unlettered Combination Lenses‡

TSO-113D	Without any Mounting Attachments	26 lbs.	46404•	$48.00
TSW-113D	Span Wire	33 lbs.	42224	53.20
TSM-113D	Mast Arm	38 lbs.	42225	57.80
TSV-113D	Vertical-Bracket Arm, less Pole Clamps	36 lbs.	42230	54.00★
TSH-113D	Horizontal-Bracket Arm, less Pole Clamps	77 lbs.	42231	61.60★
TSB-113D	Horizontal-Bracket with Fuse Compartment, less Pole Clamps	40 lbs.	42232	69.20★
TSP-113D UG	4-Inch Post, Underground Feed	36 lbs.	42226	54.20
TSP-113D OH	4-Inch Post, Overhead Feed	42 lbs.	42227	57.60
TSU-113D UG	1½-Inch Nipple, Underground Feed	27 lbs.	42228	49.80
TSU-113D OH	1½-Inch Nipple, Overhead Feed	33 lbs.	42229	53.20

Four-Section, One-Way Signals

With Red, Amber, Green, and "Special"★★ Unlettered Combination Lenses‡

TSO-114D	Without any Mounting Attachments	34 lbs.	46405•	$64.00
TSW-114D	Span Wire	41 lbs.	42233	69.20
TSM-114D	Mast Arm	46 lbs.	42234	73.80
TSV-114D	Vertical-Bracket Arm, less Pole Clamps	44 lbs.	42239	70.00★
TSH-114D	Horizontal-Bracket Arm, less Pole Clamps	85 lbs.	42240	77.60★
TSP-114D UG	4-Inch Post, Underground Feed	44 lbs.	42235	70.20
TSP-114D OH	4-Inch Post, Overhead Feed	50 lbs.	42236	73.60
TSU-114D UG	1½-Inch Nipple, Underground Feed	35 lbs.	42237	65.80
TSU-114D OH	1½-Inch Nipple, Overhead Feed	41 lbs.	42238	69.20

Prices do not include incandescent lamps. **Dimensions,** section 613.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

★★Specify type of lens desired in fourth section. See section 608, page 2. •Denotes price changes or addition.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

CROUSE-HINDS

NOTICE OF PRICE CHANGE

Applying to

TRAFFIC SIGNAL LAMPS
and
DETACHABLE HOODS OVER 8 INCHES LONG

Traffic Signal Lamps

Where specifications require the furnishing of traffic signal lamps with signals and beacons, the list price of the lamps is to be added to the list price of the signal, and the usual traffic signal discounts are to be applied to the combined list prices.

Wattage of Lamp	Hours Life	List, each 115 Volts
60-watt	2000	$0.25
67-watt	3000	0.30
40-watt	2000	0.35
100-watt	2000	0.40
111-watt	3000	0.45

Example	List, each
1 Cat. No. 42592, Type TSW-443D signal	$156.00
12 60-watt, 115-volt lamps @ $0.25 each	3.00
Total List Price	$159.00
Less 15% Discount	23.85
Net Price	$135.15

Detachable Hoods

In our present Catalog 226, there is listed an extra charge of $2.00 list per hood for substituting long hoods in place of the standard 8-inch hood.

Effective immediately, the list additional for all hoods over 8 inches long will be $3.00.

Please correct the footnotes in your Traffic Signal Catalog on the following pages:

Section 601—Pages 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25 and 26.

Section 602—Pages 2, 2D, and 3.

CH

CROUSE-HINDS

Two-Section Adjustable Traffic Signals

With Red and Green Unlettered Combination Lenses‡

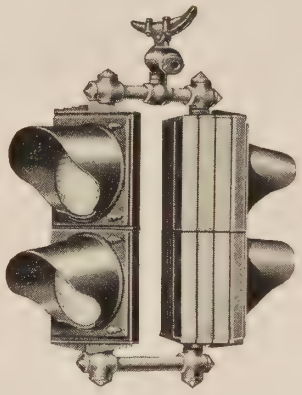


Fig. 1
Type TRW-222D Two-Way Signal
Span-Wire Mounting

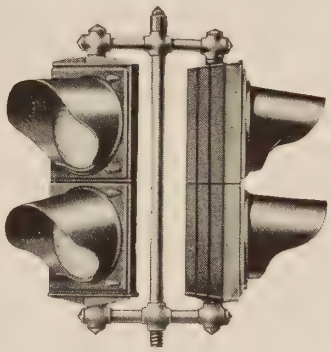


Fig. 2
Type TRU-222D Two-Way Signal
1½-Inch Nipple Mounting
Underground Feed

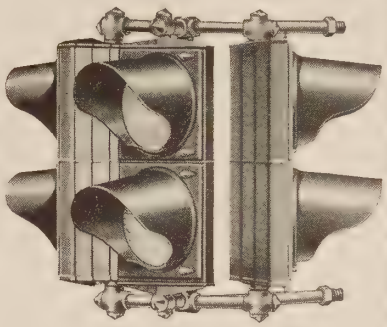
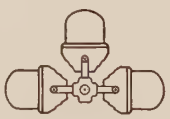


Fig. 3
Type TRV-332D Three-Way Signal
Vertical Bracket-Arm Mounting

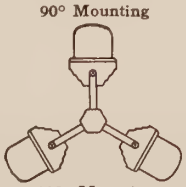
Two-Way, Two-Section Adjustable Signals

Type	Mounting	Net Wt.	Cat. No.	List, each‡
TRW-222D	Span Wire	61 lbs.	42241	$ 82.00
TRM-222D	Mast Arm	66 lbs.	42242	86.60
TRV-222D	Vertical-Bracket Arm, less Pole Clamps	58 lbs.	42243	84.00★
TTV-222D	Tandem-Bracket Arm, less Pole Clamps	55 lbs.	42704	84.00★
TRP-222D UG	4-Inch Post, Underground Feed	70 lbs.	42244	83.00
TRP-222D OH	4-Inch Post, Overhead Feed	76 lbs.	42245	87.60
TIRP-222D UG	4-Inch Post with Base Light, Underground Feed	80 lbs.	42246	99.00
TIRP-222D OH	4-Inch Post with Base Light, Overhead Feed	86 lbs.	42247	103.60
TRU-222D UG	1½-Inch Nipple, Underground Feed	61 lbs.	42248	78.60
TRU-222D OH	1½-Inch Nipple, Overhead Feed	67 lbs.	42249	83.20
TRA-222D UG	Pedestal with Base Light, Underground Feed	305 lbs.	42250	198.00
TRA-222D OH	Pedestal with Base Light, Overhead Feed	311 lbs.	42251	202.60

Three-Way, Two-Section Adjustable Signals



90° Mounting



120° Mounting

Type	Mounting	Net Wt.	Cat. No.	List, each‡
TRW-332D	Span Wire	91 lbs.	42252	$121.00
TRM-332D	Mast Arm	96 lbs.	42253	125.60
TRV-332D	Vertical-Bracket Arm, less Pole Clamps	88 lbs.	42254	123.00★
TRP-332D UG	4-Inch Post, Underground Feed	99 lbs.	42255	122.00
TRP-332D OH	4-Inch Post, Overhead Feed	105 lbs.	42256	126.60
TIRP-332D UG	4-Inch Post with Base Light, Underground Feed	109 lbs.	42257	138.00
TIRP-332D OH	4-Inch Post with Base Light, Overhead Feed	115 lbs.	42258	142.60
TRU-332D UG	1½-Inch Nipple, Underground Feed	91 lbs.	42259	117.60
TRU-332D OH	1½-Inch Nipple, Overhead Feed	97 lbs.	42260	122.20
TRA-332D UG	Pedestal with Base Light, Underground Feed	336 lbs.	42261	237.00
TRA-332D OH	Pedestal with Base Light, Overhead Feed	342 lbs.	42262	241.60

Prices do not include incandescent lamps. **Dimensions,** section 613.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $3.00 per hood.• See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price change.

CROUSE-HINDS

Two-Section Adjustable Traffic Signals

With Red and Green Unlettered Combination Lenses‡

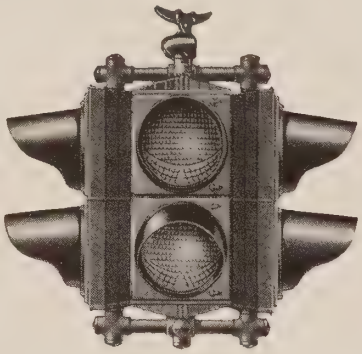


Fig. 4
Type TRW-442D Four-Way Signal
Span-Wire Mounting

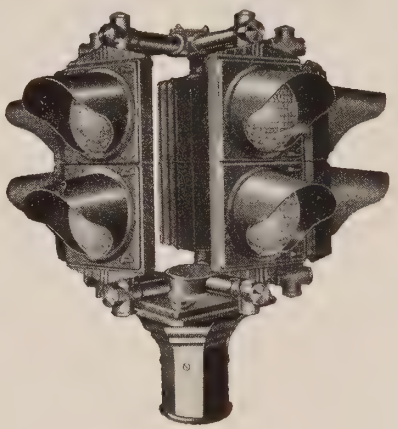
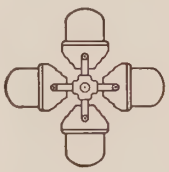


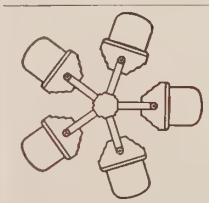
Fig. 5
Type TRP-552D Five-Way Signal
4-Inch Post Mounting

Four-Way, Two-Section Adjustable Signals



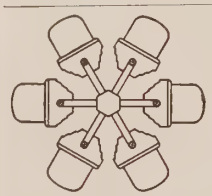
Type	Mounting	Net Wt.	Cat. No.	List, each‡
TRW-442D	Span Wire	121 lbs.	42263	$160.00
TRM-442D	Mast Arm	126 lbs.	42264	164.60
TRV-442D	Vertical-Bracket Arm, less Pole Clamps	118 lbs.	42265	162.00★
TRP-442D UG	4-Inch Post, Underground Feed	130 lbs.	42266	161.00
TRP-442D OH	4-Inch Post, Overhead Feed	136 lbs.	42267	165.60
TIRP-442D UG	4-Inch Post with Base Light, Underground Feed	140 lbs.	42268	177.00
TIRP-442D OH	4-Inch Post with Base Light, Overhead Feed	146 lbs.	42269	181.60
TRU-442D UG	1½-Inch Nipple, Underground Feed	121 lbs.	42270	156.60
TRU-442D OH	1½-Inch Nipple, Overhead Feed	127 lbs.	42271	161.20
TRA-442D UG	Pedestal with Base Light, Underground Feed	368 lbs.	42272	276.00
TRA-442D OH	Pedestal with Base Light, Overhead Feed	374 lbs.	42273	280.60

Five-Way, Two-Section Adjustable Signals



TRW-552D	Span Wire	191 lbs.	46336	$199.00
TRM-552D	Mast Arm	196 lbs.	46337	203.60
TRP-552D UG	4-Inch Post, Underground Feed	200 lbs.	42274	207.00
TRP-552D OH	4-Inch Post, Overhead Feed	206 lbs.	42275	211.60
TIRP-552D UG	4-Inch Post with Base Light, Underground Feed	213 lbs.	42276	223.00
TIRP-552D OH	4-Inch Post with Base Light, Overhead Feed	219 lbs.	42277	227.60
TRA-552D UG	Pedestal with Base Light, Underground Feed	410 lbs.	42278	315.00
TRA-552D OH	Pedestal with Base Light, Overhead Feed	416 lbs.	42279	319.60

Six-Way, Two-Section Adjustable Signals



TRW-662D	Span Wire	221 lbs.	46338	$238.00
TRM-662D	Mast Arm	226 lbs.	46339	242.60
TRP-662D UG	4-Inch Post, Underground Feed	230 lbs.	42280	246.00
TRP-662D OH	4-Inch Post, Overhead Feed	236 lbs.	42281	250.60
TIRP-662D UG	4-Inch Post with Base Light, Underground Feed	243 lbs.	42282	262.00
TIRP-662D OH	4-Inch Post with Base Light, Overhead Feed	249 lbs.	42283	266.60
TRA-662D UG	Pedestal with Base Light, Underground Feed	440 lbs.	42284	354.00
TRA-662D OH	Pedestal with Base Light, Overhead Feed	446 lbs.	42285	358.60

Prices do not include incandescent lamps. **Dimensions,** section 613.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $3.00 per hood.• See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price change.

CROUSE-HINDS

Three-Section Adjustable Traffic Signals

With Red, Amber, and Green Unlettered Combination Lenses‡

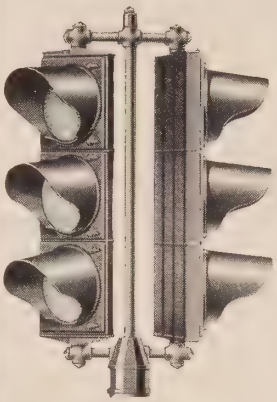


Fig. 1
Type TRP-223D Two-Way Signal
4-Inch Post Mounting
Underground Feed

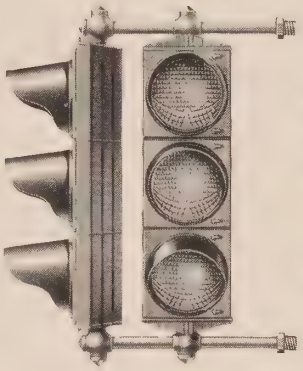


Fig. 2
Type TTV-223D Two-Way Signal
Tandem Bracket-Arm Mounting

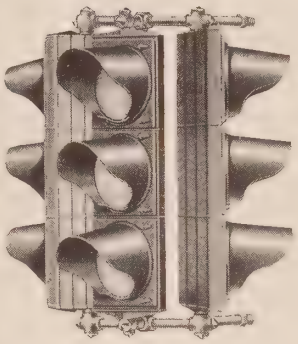


Fig. 3
Type TRV-333D Three-Way Signal
Vertical Bracket-Arm Mounting

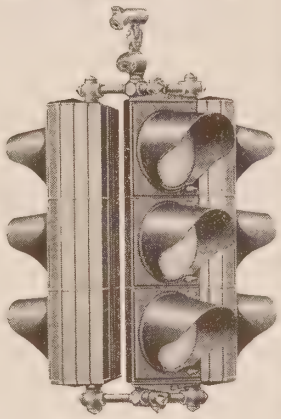
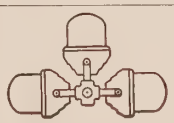


Fig. 4
Type TRM-333D Three-Way Signal
Mast-Arm Mounting

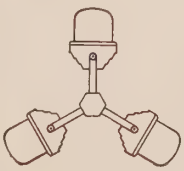
Two-Way, Three-Section Adjustable Signals

Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TRW-223D	Span Wire	77 lbs.	42286	$114.00
TRM-223D	Mast Arm	82 lbs.	42287	118.60
TRV-223D	Vertical-Bracket Arm, less Pole Clamps	74 lbs.	42288	116.00★
TTV-223D	Tandem-Bracket Arm, less Pole Clamps	71 lbs.	42705	116.00★
TRP-223D UG	4-Inch Post, Underground Feed	86 lbs.	42289	115.00
TRP-223D OH	4-Inch Post, Overhead Feed	92 lbs.	42290	119.60
TIRP-223D UG	4-Inch Post with Base Light, Underground Feed	96 lbs.	42291	131.00
TIRP-223D OH	4-Inch Post with Base Light, Overhead Feed	102 lbs.	42292	135.60
TRU-223D UG	1½-Inch Nipple, Underground Feed	77 lbs.	42293	110.60
TRU-223D OH	1½-Inch Nipple, Overhead Feed	83 lbs.	42294	115.20
TRA-223D UG	Pedestal with Base Light, Underground Feed	321 lbs.	42295	230.00
TRA-223D OH	Pedestal with Base Light, Overhead Feed	327 lbs.	42296	234.60

Three-Way, Three-Section Adjustable Signals



90° Mounting



120° Mounting

Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TRW-333D	Span Wire	115 lbs.	42297	$169.00
TRM-333D	Mast Arm	120 lbs.	42298	173.60
TRV-333D	Vertical-Bracket Arm, less Pole Clamps	112 lbs.	42299	171.00★
TRP-333D UG	4-Inch Post, Underground Feed	123 lbs.	42300	170.00
TRP-333D OH	4-Inch Post, Overhead Feed	129 lbs.	42301	174.60
TIRP-333D UG	4-Inch Post with Base Light, Underground Feed	133 lbs.	42302	186.00
TIRP-333D OH	4-Inch Post with Base Light, Overhead Feed	139 lbs.	42303	190.60
TRU-333D UG	1½-Inch Nipple, Underground Feed	115 lbs.	42304	165.60
TRU-333D OH	1½-Inch Nipple, Overhead Feed	121 lbs.	42305	170.20
TRA-333D UG	Pedestal with Base Light, Underground Feed	360 lbs.	42306	285.00
TRA-333D OH	Pedestal with Base Light, Overhead Feed	366 lbs.	42307	289.60

Prices do not include incandescent lamps. **Dimensions,** section 613.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price changes.

CROUSE-HINDS

Three-Section Adjustable Traffic Signals

With Red, Amber, and Green Unlettered Combination Lenses‡

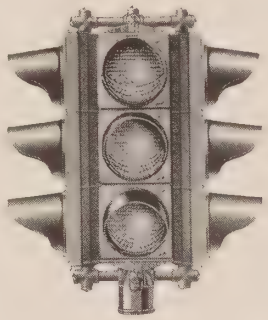


Fig. 5
Type TRP-443D Four-Way Signal
4-Inch Post Mounting

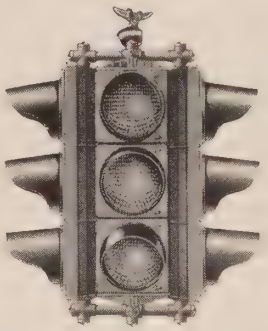


Fig. 6
Type TRW-443D Four-Way Signal
Span-Wire Mounting

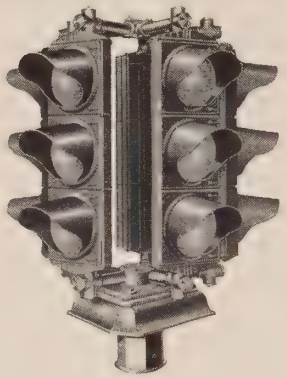
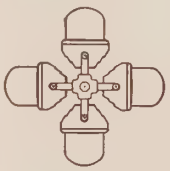


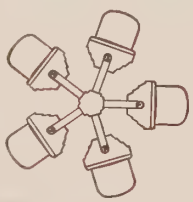
Fig. 7
Type TIRP-553D Five-Way Signal
4-Inch Post Mounting with Base Light

Four-Way, Three-Section Adjustable Signals



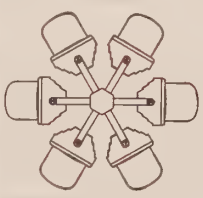
Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TRW-443D	Span Wire	153 lbs.	42308	$224.00
TRM-443D	Mast Arm	158 lbs.	42309	228.60
TRV-443D	Vertical-Bracket Arm, less Pole Clamps	150 lbs.	42310	226.00★
TRP-443D UG	4-Inch Post, Underground Feed	162 lbs.	42311	225.00
TRP-443D OH	4-Inch Post, Overhead Feed	168 lbs.	42312	229.60
TIRP-443D UG	4-Inch Post with Base Light, Underground Feed	172 lbs.	42313	241.00
TIRP-443D OH	4-Inch Post with Base Light, Overhead Feed	178 lbs.	42314	245.60
TRU-443D UG	1½-Inch Nipple, Underground Feed	153 lbs.	42315	220.60
TRU-443D OH	1½-Inch Nipple, Overhead Feed	159 lbs.	42316	225.20
TRA-443D UG	Pedestal with Base Light, Underground Feed	400 lbs.	42317	340.00
TRA-443D OH	Pedestal with Base Light, Overhead Feed	406 lbs.	42318	344.60

Five-Way, Three-Section Adjustable Signals



TRW-553D	Span Wire	231 lbs.	46340•	$279.00
TRM-553D	Mast Arm	236 lbs.	46341•	283.60
TRP-553D UG	4-Inch Post, Underground Feed	240 lbs.	42319	287.00
TRP-553D OH	4-Inch Post, Overhead Feed	246 lbs.	42320	291.60
TIRP-553D UG	4-Inch Post with Base Light, Underground Feed	253 lbs.	42321	303.00
TIRP-553D OH	4-Inch Post with Base Light, Overhead Feed	259 lbs.	42322	307.60
TRA-553D UG	Pedestal with Base Light, Underground Feed	450 lbs.	42323	395.00
TRA-553D OH	Pedestal with Base Light, Overhead Feed	456 lbs.	42324	399.60

Six-Way, Three-Section Adjustable Signals



TRW-663D	Span Wire	269 lbs.	46342•	$334.00
TRM-663D	Mast Arm	274 lbs.	46343•	338.60
TRP-663D UG	4-Inch Post, Underground Feed	278 lbs.	42325	342.00
TRP-663D OH	4-Inch Post, Overhead Feed	284 lbs.	42326	346.60
TIRP-663D UG	4-Inch Post with Base Light, Underground Feed	291 lbs.	42327	358.00
TIRP-663D OH	4-Inch Post with Base Light, Overhead Feed	297 lbs.	42328	362.60
TRA-663D UG	Pedestal with Base Light, Underground Feed	488 lbs.	42329	450.00
TRA-663D OH	Pedestal with Base Light, Overhead Feed	494 lbs.	42330	454.60

Prices do not include incandescent lamps. **Dimensions,** section 613.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price changes or addition.

CROUSE-HINDS

Four-Section Adjustable Traffic Signals

With Red, Amber, Green, and "Special" Unlettered Combination Lenses‡**

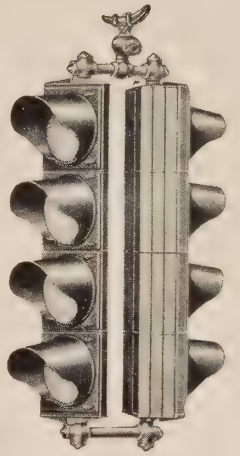


Fig. 1
Type TRW-224D Two-Way Signal
Span-Wire Mounting

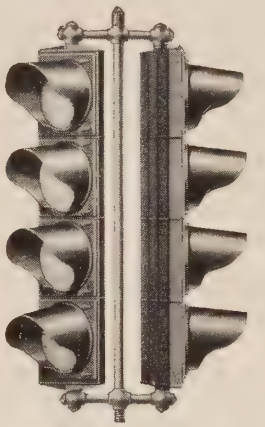


Fig. 2
Type TRU-224D Two-Way Signal
1½-Inch Nipple Mounting
Underground Feed

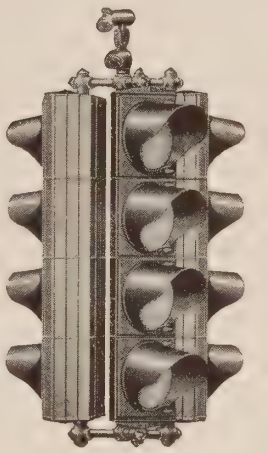


Fig. 3
Type TRM-334D Three-Way Signal
Mast-Arm Mounting

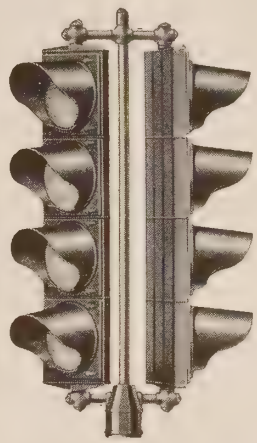
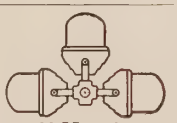


Fig. 4
Type TRP-224D Two-Way Signal
4-Inch Post Mounting
Underground Feed

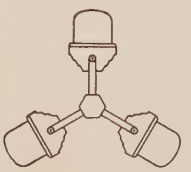
Two-Way, Four-Section Adjustable Signals

Type	Mounting	Net Wt.	Cat. No.	List, each‡
TRW-224D	Span Wire	93 lbs.	42331	$146.00
TRM-224D	Mast Arm	98 lbs.	42332	150.60
TRV-224D	Vertical-Bracket Arm, less Pole Clamps	90 lbs.	42333	148.00★
TTV-224D	Tandem-Bracket Arm, less Pole Clamps	87 lbs.	42706	148.00★
TRP-224D UG	4-Inch Post, Underground Feed	102 lbs.	42334	147.00
TRP-224D OH	4-Inch Post, Overhead Feed	108 lbs.	42335	151.60
TIRP-224D UG	4-Inch Post with Base Light, Underground Feed	112 lbs.	42336	163.00
TIRP-224D OH	4-Inch Post with Base Light, Overhead Feed	118 lbs.	42337	167.60
TRU-224D UG	1½-Inch Nipple, Underground Feed	93 lbs.	42338	142.60
TRU-224D OH	1½-Inch Nipple, Overhead Feed	99 lbs.	42339	147.20
TRA-224D UG	Pedestal with Base Light, Underground Feed	337 lbs.	42340	262.00
TRA-224D OH	Pedestal with Base Light, Overhead Feed	343 lbs.	42341	266.60

Three-Way, Four-Section Adjustable Signals



90° Mounting



120° Mounting

Type	Mounting	Net Wt.	Cat. No.	List, each‡
TRW-334D	Span Wire	139 lbs.	42342	$217.00
TRM-334D	Mast Arm	144 lbs.	42343	221.60
TRV-334D	Vertical-Bracket Arm, less Pole Clamps	136 lbs.	42344	219.00★
TRP-334D UG	4-Inch Post, Underground Feed	147 lbs.	42345	218.00
TRP-334D OH	4-Inch Post, Overhead Feed	153 lbs.	42346	222.60
TIRP-334D UG	4-Inch Post with Base Light, Underground Feed	157 lbs.	42347	234.00
TIRP-334D OH	4-Inch Post with Base Light, Overhead Feed	163 lbs.	42348	238.60
TRU-334D UG	1½-Inch Nipple, Underground Feed	139 lbs.	42349	213.60
TRU-334D OH	1½-Inch Nipple, Overhead Feed	145 lbs.	42350	218.20
TRA-334D UG	Pedestal with Base Light, Underground Feed	384 lbs.	42351	333.00
TRA-334D OH	Pedestal with Base Light, Overhead Feed	390 lbs.	42352	337.60

Prices do not include incandescent lamps. **Dimensions,** section 613.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $3.00 per hood.• See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

★★Specify type of lens desired in fourth section. See section 608, page 2.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price change.

CROUSE-HINDS

Four-Section Adjustable Traffic Signals

With Red, Amber, Green, and "Special"** Unlettered Combination Lenses‡

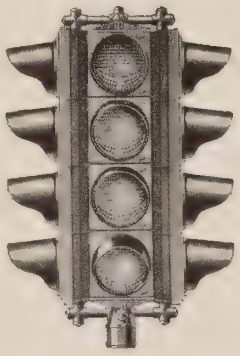


Fig. 5
Type TRP-444D Four-Way Signal
4-Inch Post Mounting

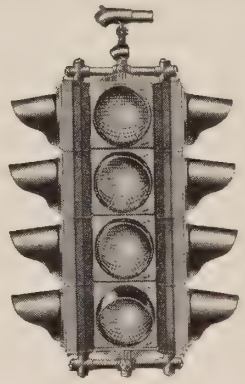


Fig. 6
Type TRM-444D Four-Way Signal
Mast-Arm Mounting

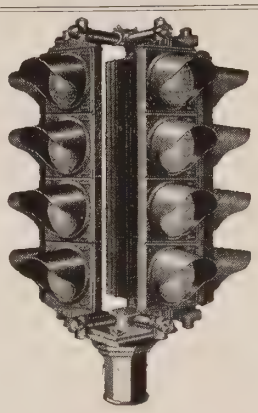
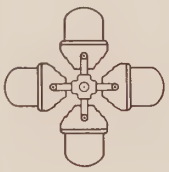


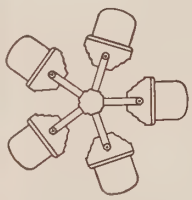
Fig. 7
Type TRP-554D Five-Way Signal
4-Inch Post Mounting

Four-Way, Four-Section Adjustable Signals



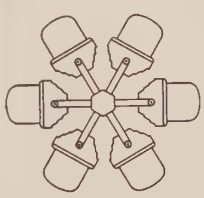
Type	Mounting	Net Wt.	Cat. No.	List, each‡
TRW-444D	Span Wire	185 lbs.	42353	$288.00
TRM-444D	Mast Arm	190 lbs.	42354	292.60
TRV-444D	Vertical-Bracket Arm, less Pole Clamps	182 lbs.	42355	290.00★
TRP-444D UG	4-Inch Post, Underground Feed	194 lbs.	42356	289.00
TRP-444D OH	4-Inch Post, Overhead Feed	200 lbs.	42357	293.60
TIRP-444D UG	4-Inch Post with Base Light, Underground Feed	204 lbs.	42358	305.00
TIRP-444D OH	4-Inch Post with Base Light, Overhead Feed	210 lbs.	42359	309.60
TRU-444D UG	1½-Inch Nipple, Underground Feed	185 lbs.	42360	284.60
TRU-444D OH	1½-Inch Nipple, Overhead Feed	191 lbs.	42361	289.20
TRA-444D UG	Pedestal with Base Light, Underground Feed	432 lbs.	42362	404.00
TRA-444D OH	Pedestal with Base Light, Overhead Feed	438 lbs.	42363	408.60

Five-Way, Four-Section Adjustable Signals



TRW-554D	Span Wire	271 lbs.	46344	$359.00
TRM-554D	Mast Arm	276 lbs.	46345	363.60
TRP-554D UG	4-Inch Post, Underground Feed	280 lbs.	42364	367.00
TRP-554D OH	4-Inch Post, Overhead Feed	286 lbs.	42365	371.60
TIRP-554D UG	4-Inch Post with Base Light, Underground Feed	293 lbs.	42366	383.00
TIRP-554D OH	4-Inch Post with Base Light, Overhead Feed	299 lbs.	42367	387.60
TRA-554D UG	Pedestal with Base Light, Underground Feed	490 lbs.	42368	475.00
TRA-554D OH	Pedestal with Base Light, Overhead Feed	496 lbs.	42369	479.60

Six-Way, Four-Section Adjustable Signals



TRW-664D	Span Wire	317 lbs.	46346	$430.00
TRM-664D	Mast Arm	322 lbs.	46347	434.60
TRP-664D UG	4-Inch Post, Underground Feed	326 lbs.	42370	438.00
TRP-664D OH	4-Inch Post, Overhead Feed	332 lbs.	42371	442.60
TIRP-664D UG	4-Inch Post with Base Light, Underground Feed	339 lbs.	42372	454.00
TIRP-664D OH	4-Inch Post with Base Light, Overhead Feed	345 lbs.	42373	458.60
TRA-664D UG	Pedestal with Base Light, Underground Feed	536 lbs.	42374	546.00
TRA-664D OH	Pedestal with Base Light, Overhead Feed	542 lbs.	42375	550.60

Prices do not include incandescent lamps. **Dimensions,** section 613.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $3.00 per hood.• See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

★★Specify type of lens desired in fourth section. See section 608, page 2.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price change.

CROUSE-HINDS

Four-Way Square Non-Adjustable Traffic Signals

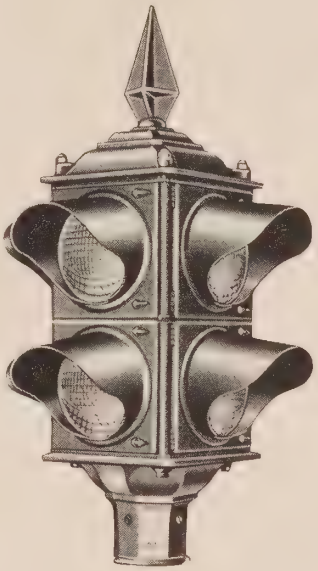


Fig. 1
Type TSP-442D Four-Way
Two-Section Signal
4-Inch Post Mounting

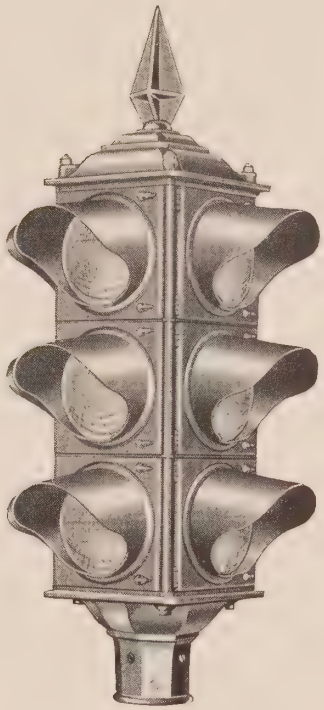


Fig. 2
Type TSP-443D Four-Way
Three-Section Signal
4-Inch Post Mounting

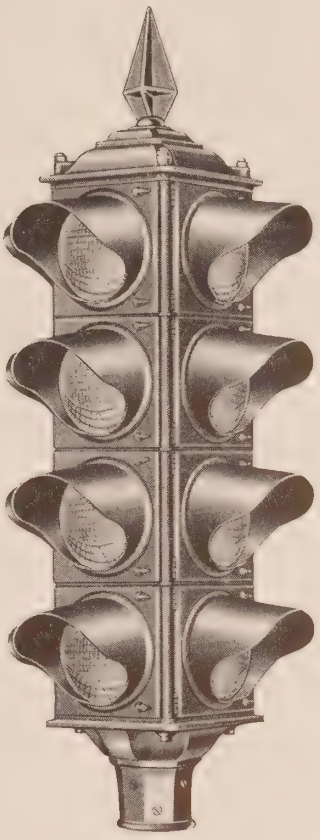


Fig. 3•
Type TSP-444D Four-Way
Four-Section Signal
4-Inch Post Mounting

On pages 17 to 26 of this section, there is described and listed a complete line of square non-adjustable traffic signals for use at regular intersections, where streets cross at right angles or approximately so. The line is complete in every respect. The listings cover two, three, and four-section signals with two, three, and four signal faces per section.

On this page are illustrated typical two, three, and four-section signals, which are representative of the line. Individual signals vary only in the number of faces and in the various mounting attachments.

•Two-section signals have red and green lenses only; three-section signals have red, amber, and green lenses; and four-section signals have red, amber, and green lenses in the three top sections, and any desired lens in the bottom section. These are standard lens combinations, but any of the special lenses listed in section 608, page 2 may be substituted.

In construction, these square non-adjustable signals closely follow the one-way and the adjustable signals described in detail on pages 1 to 7 of this section. The same optical system, including reflector assembly, door, lens, and hood are used; and these parts together with the span-wire hanger, mast-arm hanger, and overhead feed attachment are interchangeable throughout the entire Crouse-Hinds line.

This new line of signals presents an artistic and pleasing appearance. The signals are somewhat modernistic in design and the post-type signals illustrated above will go well with ornamental standards, and will present a pleasing appearance when installed on the street.

In designing this line of signals, the strict utilitarian purpose of signals has not been lost sight of. Particular attention was given first to obtaining a rugged, durable signal—one which could be installed and then forgotten. Next in importance was the making of a signal easy to install and maintain. There are mounting attachments for every installation requirement, thus making installation easy and safe. Signals are dust-tight and weatherproof, thus reducing maintenance to a minimum. Relamping is accomplished by merely opening a gasketed door.

•Denotes change in information or illustration.

Four-Way Square Non-Adjustable Traffic Signals

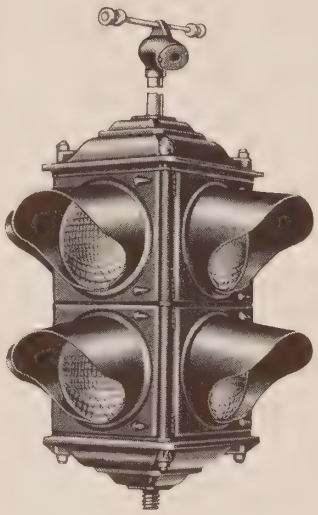


Fig. 4
Type TSU-442D Signal
1½-Inch Nipple Mounting
Overhead Feed

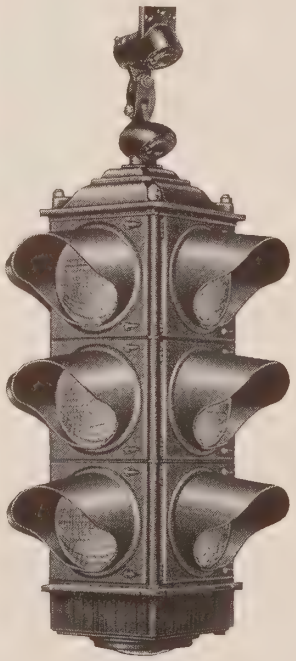


Fig. 6•
Type TIM-443D Signal
With Base Light
Mast-Arm Mounting

Mountings

Post Mounting: For mounting on top of an ornamental pole or post, the Crouse-Hinds signals are furnished with a fitter which slips over a 4-inch inside diameter pipe having an outside diameter of 4½ inches. This fitter is designed particularly to take 4-inch tenon used on ornamental traffic signal poles, the tenon being 4½ inches in diameter and 4 inches high.

The lines of the slip fitter blend artistically with the signal housing. It is rugged and durable and is securely fastened to the signal housing.

This slip fitter is held to the pole or tenon by four ⅜-inch diameter headless set screws. This mounting is shown on page 17 of this section.

Nipple Mounting: Some ornamental traffic signal poles are tapped at the top of the pole to receive a 1½-inch pipe nipple. To meet this condition, the bottom of the signal is equipped with a 1½-inch pipe nipple, which is securely fastened to the signal housing and which, in turn, may be screwed into the top of the pole. To facilitate assembly, the nipple may be removed from the signal, screwed into the top of the pole, and the signal slipped over the nipple and locked in place by a check nut on the inside of the housing. This mounting is illustrated in Fig. 4.

•**Span-Wire Mounting:** For attaching to a span wire, a span-wire clamp to take a ¼ to $^{7}/_{16}$-inch messenger wire is used. This clamp is made of malleable iron with hot-dipped galvanized finish, and is equipped with two "J" bolts, which fasten it securely to the span wire. A special cast bronze wire outlet with composition cover and universal joint is provided. This bronze wire outlet casting is large and roomy to make easy the attaching of field wires to the terminal block in the top of the signal. This mounting is illustrated in Fig. 5.

Mast-Arm Mounting: For mast-arm mounting, there is provided a cast bronze fitting which slips directly over a 2-inch pipe mast arm. This casting is equipped with ears making it possible to use one, two or three guy rods, depending upon the length of the mast arm. The fitter is fastened to the mast arm by means of two ⅜-inch set screws. A cast bronze wire outlet with composition cover and universal joint is provided between the mast-arm fitter and the signal.

Such construction means that, while the signal is securely fastened to the mast arm, it is free to swing with the wind and thus relieve the mast arm of all torsional strains. This mounting is illustrated in Fig. 6.

•**Vertical Bracket-Arm Mounting:** For mounting the signals vertically and attaching them to the side of a pole or structure, the signal is furnished with 1¼-inch bracket arms to which pole clamps or flanges may be attached. The standard bracket arm is 16⅝ inches long, which places the center line of the signal 20 inches from the outside of the pole upon which it is mounted. Due to the extreme light weight of the signal, 1¼-inch bracket arms are used. This mounting is illustrated in Fig. 7. If specified on the order, a wire outlet will be put in either arm.

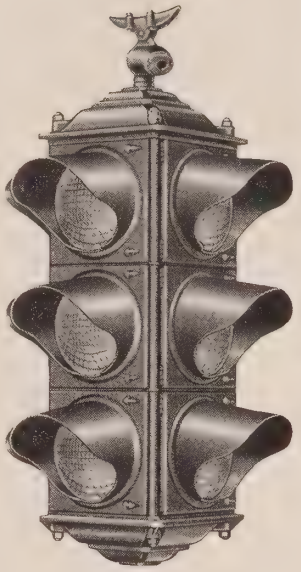


Fig. 5
Type TSW-443D Signal
Span-Wire Mounting

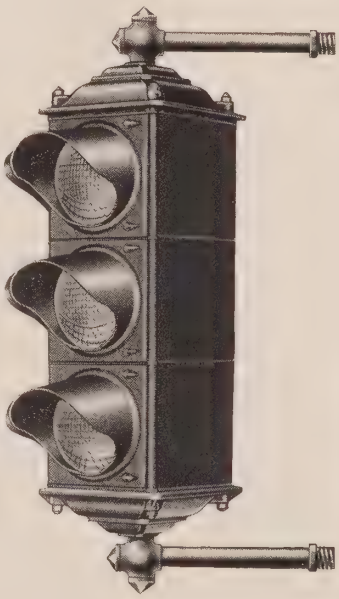


Fig. 7
Type TSV-223D (90°) Signal
Vertical Bracket-Arm Mounting

•Denotes change in information or illustration.

CROUSE-HINDS

Four-Way Square Non-Adjustable Traffic Signals

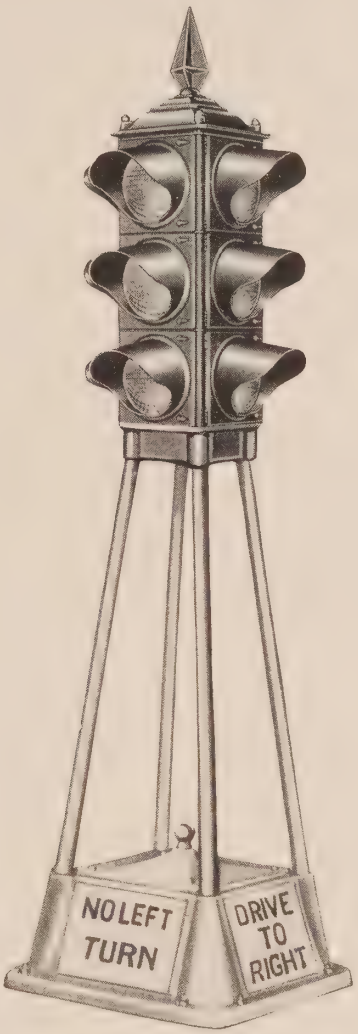


Fig. 1
Type TSA-443D Signal
Pedestal Mounting

Pedestal Mounting: For intersections having a considerable area, it is often advantageous to mount a signal in the center of the intersection on a substantial concrete foundation. Such a signal is not only more visible but also forms a pivot around which traffic must turn, thus assisting in the alignment of traffic. The pedestal shown above is the open type, which gives the vehicle driver a clear view at all times. It is recommended that the foundation of such signals be equipped with a substantial foundation form, which is listed and described in section 608, page 6.

Pedestal-mounted signals are always equipped with a base light, which illuminates the legs, the foundation, and the adjacent roadway.

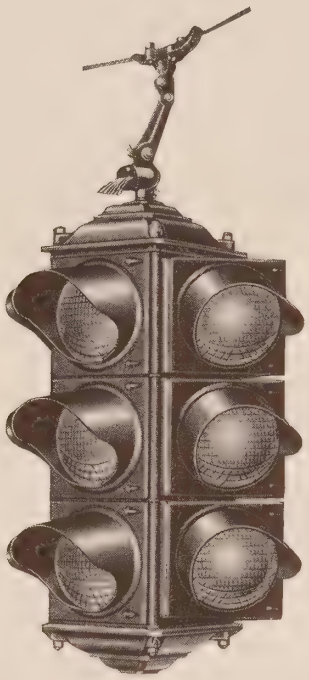


Fig. 2
Span-Wire Signal with Angle Adapters
and Balance Adjuster

Attachments

Angle Adapters: It is advisable that the face of the signal point directly up the street which it is to control, and therefore, at irregular intersections angle adapters can be used to good advantage. Standard angle adapters, which will turn the face of the signal either 15, 30, or 45°, are obtainable. They fasten on the outside of the signal in place of the regular door. The optical system is in turn fastened to the angle-adapter housing, and the regular door and hood placed on the outside, thus turning the face of the signal, complete with its optical system, in the desired direction. These angle adapters are listed and described in section 608, page 10. The illustration above, Fig. 2, shows the application of these adapters on one face of the signal, turning that face 30°.

Balance Adjuster: Suspended signals, when equipped with angle adapters, or when one face of the signal is omitted, will not hang true. A balance adjuster, shown in Fig. 2, is placed between the signal and the span-wire or mast-arm hanger. The use of this balance adjuster will make the signal hang perfectly plumb. This balance adjuster is listed in section 608, page 10.

CROUSE-HINDS

Four-Way Square Non-Adjustable Traffic Signals

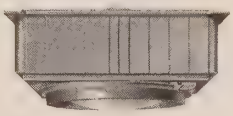


Fig. 3●
Base-Light Assembly for
Span-Wire and
Mast-Arm Signals

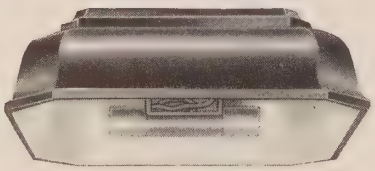


Fig. 4
Base-Light Assembly for
Post-Mounted Signals

Attachments—*Cont'd*

●**Base Lights:** A great many signals which are suspended from span wires or mast arms over the center of the intersection or which are installed on posts or pedestals in the center of the intersection, are equipped with base lights for illuminating the ground directly beneath the signal and the post or pedestal upon which they are mounted. Fig. 3 shows a standard base light which can be attached to the bottom of any four-way standard traffic signal of the span-wire or mast-arm type. This base light takes the place of the regular ornamental base casting. Inside of this base light there is an optical system consisting of a polished parabolic glass reflector, a lamp receptacle, and a clear prismatic diffusing lens in the door. This base light takes a standard signal door equipped with a clear prismatic diffusing lens. The standard base-light assembly is designed to accommodate a 50-watt, 115-volt "Vibration Service" lamp in the P-19 bulb, although, if desired, a special optical system may be placed in the base light to take a 200-watt, 115-volt lamp in the PS-30 clear bulb. The use of the 200-watt base light will give greatly increased illumination below the signal.

In Fig. 4 is shown the base-light reflector which may be attached to all two, three, and four-way square post-mounted signals. To accommodate the standard 60-watt traffic signal lamp, this reflector contains four lamp receptacles so located that there is a lamp in each corner of the reflector. This base-light reflector will illuminate the post upon which the signal is mounted and the ground adjacent thereto. This same base-light reflector is used on adjustable post-mounted signals.

Bell Box: Some cities prefer to use bells in their signal systems, to be rung during the change interval or to be rung during the display of the emergency all-red. Fig. 5 shows the standard bell box with bell, which may be installed upon any four-way standard traffic signal mounted on a span wire or mast arm. For vertical bracket-arm signals, the bell may be suspended from either arm or it may be mounted upon the post supporting the signal. Due to the fact that bells must be serviced and adjusted occasionally, it is advisable that they be mounted on the post, rather than underneath the signal.

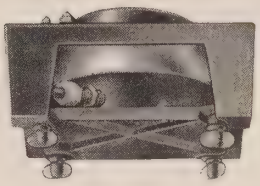


Fig. 5
HL2251 Bell Box
Complete with Bell

Fig. 6
Terminal Block

Terminal Block: All square non-adjustable signals are equipped with a nine-terminal block as illustrated in Fig. 6. For underground feed signals, this terminal block is mounted in the bottom; and for overhead feed signals, it is mounted at the top. Leads from the lamp receptacle are brought to the terminals, and to facilitate field wiring, separate binding screws are provided for all field wires.

Signal Wires

All Crouse-Hinds signals are wired with a sufficient number of wires to give any desired color sequence. Below is tabulated the legend for the signal cable. All wires are permanently marked when the signals are shipped from the factory. There are five wires on all one-way signals, and eight wires on all four-way signals. These wires may be spliced at the signal, as necessary. Wires No. 2 and No. 3 should be spliced together at the signal to form No. 23. Wires No. 4 and No. 5 should be spliced together at the signal to form No. 45. Wires No. 6A and No. 6B should be spliced together at the signal to form No. 6.

No. 1 —Common for Red only
No. 1A—Common for Amber and Green
No. 2 —Red North-South
No. 3 —Green East-West
No. 23 —Red North-South and Green East-West
No. 4 —Green North-South
No. 5 —Red East-West
No. 45 —Green North-South and Red East-West
No. 6A —Amber East-West
No. 6B —Amber North-South
No. 6 —All-Amber
No. 7 —Bell (if used)
No. 9 —Base Light (if used)

These numbers, used to identify the wiring of signals, are used on wiring diagrams sent out with each signal.

●Denotes change in illustration or information.

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Two-Way, Three-Section, Non-Adjustable

Mounting Arrangements

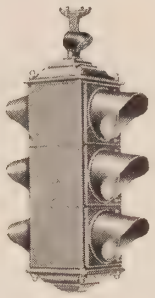


Fig. 1
Type TSW-223D
Two-Way (180°) Signal
Span-Wire Mounting

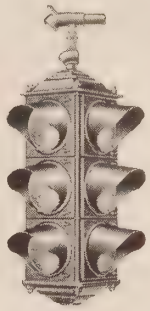


Fig. 2
Type TSM-223D
Two-Way (90°) Signal
Mast-Arm Mounting

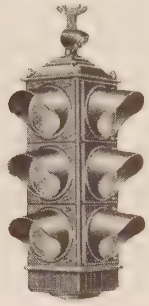


Fig. 3
Type TIW-223D
Two-Way (90°) Signal
With Base Light
Span-Wire Mounting

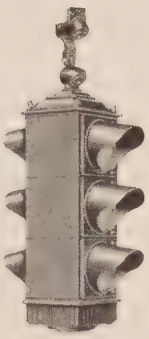


Fig. 4
Type TIM-223D
Two-Way (180°) Signal
With Base Light
Mast-Arm Mounting

Fig. 5
Type TSV-223D
Two-Way (90°) Signal
Vertical Bracket-Arm Mounting
Without Wire Outlet

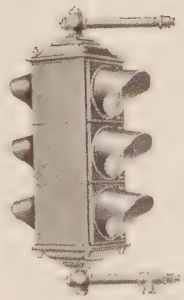


Fig. 6
Type TSV-223D
Two-Way (180°) Signal
Vertical Bracket-Arm Mounting
With Wire Outlet

Fig. 7
Type TSP-223D
Two-Way (90°) Signal
4-Inch Post Mounting
Underground Feed

Fig. 8
Type TIP-223D
Two-Way (180°) Signal
With Base Light
4-Inch Post Mounting
Underground Feed

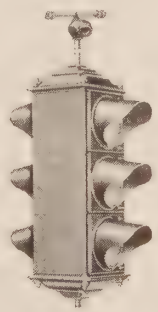


Fig. 9
Type TSU-223D
Two-Way (180°) Signal
1½-Inch Nipple Mounting
Overhead Feed

CROUSE-HINDS

Crouse-Hinds Traffic Signals

Four-Way, Three-Section, Non-Adjustable

Mounting Arrangements

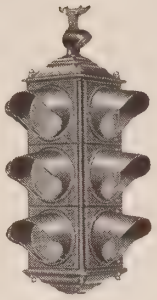


Fig. 10
Type TSW-443D Four-Way Signal
Span-Wire Mounting

Fig. 11
Type TSM-443D Four-Way Signal
Mast-Arm Mounting

Fig. 12
Type TIM-443D Four-Way Signal
With Base Light
Mast-Arm Mounting

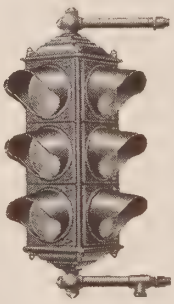


Fig. 13
Type TSV-443D Four-Way Signal
Vertical Bracket-Arm Mounting
With Wire Outlet

Fig. 14
Type TSP-443D Four-Way Signal
4-Inch Post Mounting
Underground Feed

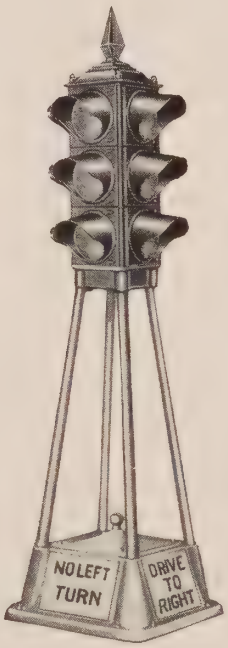


Fig. 17
Type TSA-443D
Four-Way Signal
With Base Light
Pedestal Mounting
Underground Feed

Fig. 15
Type TIP-443D Four-Way Signal
With Base Light
4-Inch Post Mounting
Underground Feed

Fig. 16
Type TSU-443D Four-Way Signal
1½-Inch Nipple Mounting
Overhead Feed

CROUSE-HINDS

Two-Section Square Non-Adjustable Traffic Signals

With Red and Green Unlettered Combination Lenses‡

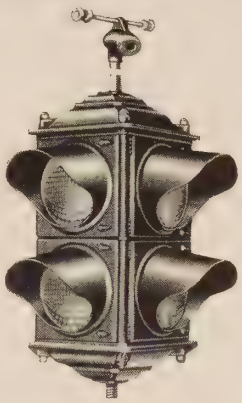


Fig. 1
Type TSU-222D Two-Way (90°) Signal
1½-Inch Nipple Mounting
Overhead Feed

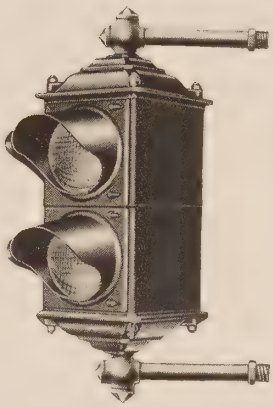


Fig. 2
Type TSV-222D Two-Way (90°) Signal
Vertical Bracket-Arm Mounting

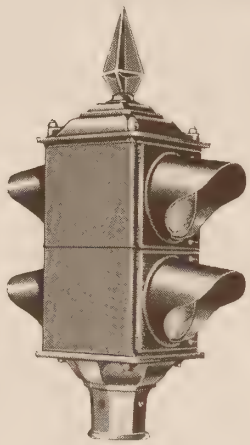


Fig. 3
Type TSP-222D Two-Way (180°) Signal
4-Inch Post Mounting
Underground Feed

Two-Way (90°), Two-Section Non-Adjustable Signals

Type	Mounting	Net Wt.	Cat. No.	List, each ‡•
TSW-222D	Span Wire	54 lbs.	42501	$ 82.00
TIW-222D	Span Wire with Base Light	59 lbs.	42502	94.00
TSM-222D	Mast Arm	59 lbs.	42503	86.60
TIM-222D	Mast Arm with Base Light	64 lbs.	42504	98.60
TSV-222D	Vertical-Bracket Arm, less Pole Clamps	59 lbs.	42505	84.00★
TSP-222D UG	4-Inch Post, Underground Feed	78 lbs.	42506	85.20
TSP-222D OH	4-Inch Post, Overhead Feed	79 lbs.	42507	88.60
TIP-222D UG	4-Inch Post with Base Light, Underground Feed	107 lbs.	42508	101.20
TIP-222D OH	4-Inch Post with Base Light, Overhead Feed	108 lbs.	42509	104.60
TSU-222D UG	1½-Inch Nipple, Underground Feed	52 lbs.	42510	79.80
TSU-222D OH	1½-Inch Nipple, Overhead Feed	53 lbs.	42511	83.20
TSA-222D UG	Pedestal with Base Light, Underground Feed	292 lbs.	42512	195.20
TSA-222D OH	Pedestal with Base Light, Overhead Feed	293 lbs.	42513	198.60

Two-Way (180°), Two-Section Non-Adjustable Signals

TSW-222D	Span Wire	54 lbs.	42514	$ 82.00
TIW-222D	Span Wire with Base Light	59 lbs.	42515	94.00
TSM-222D	Mast Arm	59 lbs.	42516	86.60
TIM-222D	Mast Arm with Base Light	64 lbs.	42517	98.60
TSV-222D	Vertical-Bracket Arm, less Pole Clamps	59 lbs.	42518	84.00★
TSP-222D UG	4-Inch Post, Underground Feed	78 lbs.	42519	85.20
TSP-222D OH	4-Inch Post, Overhead Feed	79 lbs.	42520	88.60
TIP-222D UG	4-Inch Post with Base Light, Underground Feed	107 lbs.	42521	101.20
TIP-222D OH	4-Inch Post with Base Light, Overhead Feed	108 lbs.	42522	104.60
TSU-222D UG	1½-Inch Nipple, Underground Feed	52 lbs.	42523	79.80
TSU-222D OH	1½-Inch Nipple, Overhead Feed	53 lbs.	42524	83.20
TSA-222D UG	Pedestal with Base Light, Underground Feed	292 lbs.	42525	195.20
TSA-222D OH	Pedestal with Base Light, Overhead Feed	293 lbs.	42526	198.60

Prices do not include incandescent lamps. **Dimensions,** section 613. **Angle Adapters,** section 608, page 10.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price changes.

CROUSE-HINDS

Two-Section Square Non-Adjustable Traffic Signals

With Red and Green Unlettered Combination Lenses‡

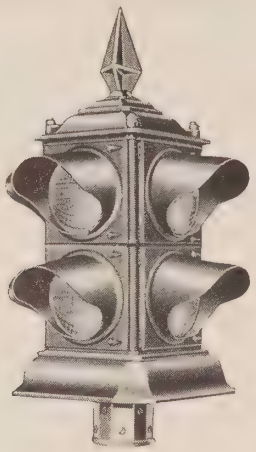


Fig. 4
Type TIP-442D Four-Way Signal
4-Inch Post Mounting with Base Light
Underground Feed

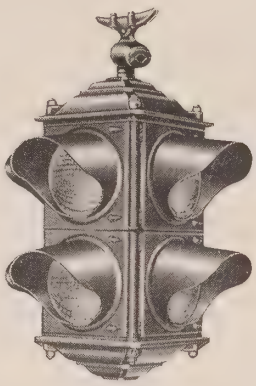


Fig. 5
Type TSW-332D Three-Way Signal
Span-Wire Mounting

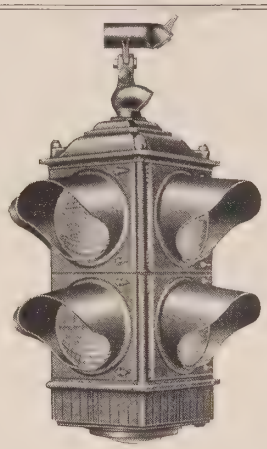
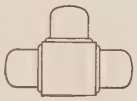


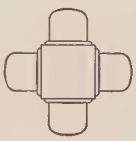
Fig. 6
Type TIM-442D Four-Way Signal
With Base Light
Mast-Arm Mounting

Three-Way, Two-Section Non-Adjustable Signals



Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TSW-332D	Span Wire	61 lbs.	42527	$ 96.00
TIW-332D	Span Wire with Base Light	66 lbs.	42528	108.00
TSM-332D	Mast Arm	66 lbs.	42529	100.60
TIM-332D	Mast Arm with Base Light	71 lbs.	42530	112.60
TSV-332D	Vertical-Bracket Arm, less Pole Clamps	66 lbs.	42531	98.00★
TSP-332D UG	4-Inch Post, Underground Feed	85 lbs.	42532	99.20
TSP-332D OH	4-Inch Post, Overhead Feed	86 lbs.	42533	102.60
TIP-332D UG	4-Inch Post with Base Light, Underground Feed	114 lbs.	42534	115.20
TIP-332D OH	4-Inch Post with Base Light, Overhead Feed	115 lbs.	42535	118.60
TSU-332D UG	1½-Inch Nipple, Underground Feed	59 lbs.	42536	93.80
TSU-332D OH	1½-Inch Nipple, Overhead Feed	60 lbs.	42537	97.20
TSA-332D UG	Pedestal with Base Light, Underground Feed	300 lbs.	42538	209.20
TSA-332D OH	Pedestal with Base Light, Overhead Feed	301 lbs.	42539	212.60

Four-Way, Two-Section Non-Adjustable Signals



TSW-442D	Span Wire	69 lbs.	42540	$110.00
TIW-442D	Span Wire with Base Light	74 lbs.	42541	122.00
TSM-442D	Mast Arm	74 lbs.	42542	114.60
TIM-442D	Mast Arm with Base Light	79 lbs.	42543	126.60
TSV-442D	Vertical-Bracket Arm, less Pole Clamps	74 lbs.	42544	112.00★
TSP-442D UG	4-Inch Post, Underground Feed	93 lbs.	42545	113.20
TSP-442D OH	4-Inch Post, Overhead Feed	94 lbs.	42546	116.60
TIP-442D UG	4-Inch Post with Base Light, Underground Feed	121 lbs.	42547	129.20
TIP-442D OH	4-Inch Post with Base Light, Overhead Feed	122 lbs.	42548	132.60
TSU-442D UG	1½-Inch Nipple, Underground Feed	67 lbs.	42549	107.80
TSU-442D OH	1½-Inch Nipple, Overhead Feed	68 lbs.	42550	111.20
TSA-442D UG	Pedestal with Base Light, Underground Feed	308 lbs.	42551	223.20
TSA-442D OH	Pedestal with Base Light, Overhead Feed	309 lbs.	42552	226.60

Prices do not include incandescent lamps. **Dimensions,** section 613. **Angle Adapters,** section 608, page 10.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price changes.

CROUSE-HINDS

Three-Section Square Non-Adjustable Traffic Signals

With Red, Amber, and Green Unlettered Combination Lenses‡

Fig. 1
Type TIP-223D Two-Way (180°) Signal
4-Inch Post Mounting with Base Light
Underground Feed

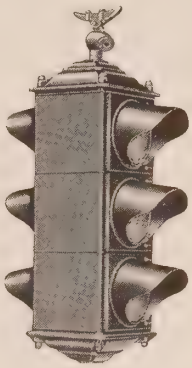
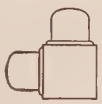


Fig. 2
Type TSW-223D Two-Way (180°) Signal
Span-Wire Mounting

Fig. 3
Type TSV-223D Two-Way (90°) Signal
Vertical Bracket-Arm Mounting

Two-Way (90°), Three-Section Non-Adjustable Signals



Type	Mounting	Net Wt.	Cat. No.	List, each ‡•
TSW-223D	Span Wire	72 lbs.	42553	$114.00
TIW-223D	Span Wire with Base Light	77 lbs.	42554	126.00
TSM-223D	Mast Arm	77 lbs.	42555	118.60
TIM-223D	Mast Arm with Base Light	82 lbs.	42556	130.60
TSV-223D	Vertical-Bracket Arm, less Pole Clamps	77 lbs.	42557	116.00★
TSP-223D UG	4-Inch Post, Underground Feed	96 lbs.	42558	117.20
TSP-223D OH	4-Inch Post, Overhead Feed	97 lbs.	42559	120.60
TIP-223D UG	4-Inch Post with Base Light, Underground Feed	125 lbs.	42560	133.20
TIP-223D OH	4-Inch Post with Base Light, Overhead Feed	126 lbs.	42561	136.60
TSU-223D UG	1½-Inch Nipple, Underground Feed	70 lbs.	42562	111.80
TSU-223D OH	1½-Inch Nipple, Overhead Feed	71 lbs.	42563	115.20
TSA-223D UG	Pedestal with Base Light, Underground Feed	310 lbs.	42564	227.20
TSA-223D OH	Pedestal with Base Light, Overhead Feed	311 lbs.	42565	230.60

Two-Way (180°), Three-Section Non-Adjustable Signals

Type	Mounting	Net Wt.	Cat. No.	List, each ‡•
TSW-223D	Span Wire	72 lbs.	42566	$114.00
TIW-223D	Span Wire with Base Light	77 lbs.	42567	126.00
TSM-223D	Mast Arm	77 lbs.	42568	118.60
TIM-223D	Mast Arm with Base Light	82 lbs.	42569	130.60
TSV-223D	Vertical-Bracket Arm, less Pole Clamps	77 lbs.	42570	116.00★
TSP-223D UG	4-Inch Post, Underground Feed	96 lbs.	42571	117.20
TSP-223D OH	4-Inch Post, Overhead Feed	97 lbs.	42572	120.60
TIP-223D UG	4-Inch Post with Base Light, Underground Feed	125 lbs.	42573	133.20
TIP-223D OH	4-Inch Post with Base Light, Overhead Feed	126 lbs.	42574	136.60
TSU-223D UG	1½-Inch Nipple, Underground Feed	70 lbs.	42575	111.80
TSU-223D OH	1½-Inch Nipple, Overhead Feed	71 lbs.	42576	115.20
TSA-223D UG	Pedestal with Base Light, Underground Feed	310 lbs.	42577	227.20
TSA-223D OH	Pedestal with Base Light, Overhead Feed	311 lbs.	42578	230.60

Prices do not include incandescent lamps. **Dimensions,** section 613. **Angle Adapters,** section 608, page 10.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price changes.

CROUSE-HINDS

Three-Section Square Non-Adjustable Traffic Signals

With Red, Amber, and Green Unlettered Combination Lenses‡

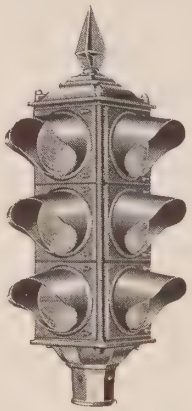


Fig. 4
Type TSP-443D Four-Way Signal
4-Inch Post Mounting
Underground Feed

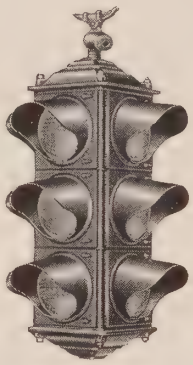


Fig. 5
Type TSW-443D Four-Way Signal
Span-Wire Mounting

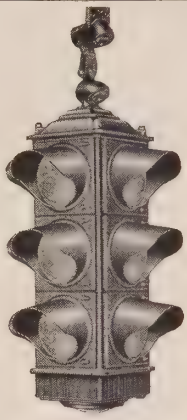
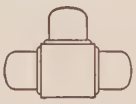


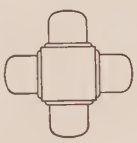
Fig. 6•
Type TIM-443D Four-Way Signal
With Base Light
Mast-Arm Mounting

Three-Way, Three-Section Non-Adjustable Signals



Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TSW-333D	Span Wire	83 lbs.	42579	$135.00
TIW-333D	Span Wire with Base Light	88 lbs.	42580	147.00
TSM-333D	Mast Arm	88 lbs.	42581	139.60
TIM-333D	Mast Arm with Base Light	93 lbs.	42582	151.60
TSV-333D	Vertical-Bracket Arm, less Pole Clamps	88 lbs.	42583	137.00★
TSP-333D UG	4-Inch Post, Underground Feed	107 lbs.	42584	138.20
TSP-333D OH	4-Inch Post, Overhead Feed	108 lbs.	42585	141.60
TIP-333D UG	4-Inch Post with Base Light, Underground Feed	136 lbs.	42586	154.20
TIP-333D OH	4-Inch Post with Base Light, Overhead Feed	137 lbs.	42587	157.60
TSU-333D UG	1½-Inch Nipple, Underground Feed	81 lbs.	42588	132.80
TSU-333D OH	1½-Inch Nipple, Overhead Feed	82 lbs.	42589	136.20
TSA-333D UG	Pedestal with Base Light, Underground Feed	322 lbs.	42590	248.20
TSA-333D OH	Pedestal with Base Light, Overhead Feed	323 lbs.	42591	251.60

Four-Way, Three-Section Non-Adjustable Signals



Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TSW-443D	Span Wire	94 lbs.	42592	$156.00
TIW-443D	Span Wire with Base Light	99 lbs.	42593	168.00
TSM-443D	Mast Arm	99 lbs.	42594	160.60
TIM-443D	Mast Arm with Base Light	104 lbs.	42595	172.60
TSV-443D	Vertical-Bracket Arm, less Pole Clamps	99 lbs.	42596	158.00★
TSP-443D UG	4-Inch Post, Underground Feed	118 lbs.	42597	159.20
TSP-443D OH	4-Inch Post, Overhead Feed	119 lbs.	42598	162.60
TIP-443D UG	4-Inch Post with Base Light, Underground Feed	147 lbs.	42599	175.20
TIP-443D OH	4-Inch Post with Base Light, Overhead Feed	148 lbs.	42600	178.60
TSU-443D UG	1½-Inch Nipple, Underground Feed	92 lbs.	42601	153.80
TSU-443D OH	1½-Inch Nipple, Overhead Feed	93 lbs.	42602	157.20
TSA-443D UG	Pedestal with Base Light, Underground Feed	336 lbs.	42603	269.20
TSA-443D OH	Pedestal with Base Light, Overhead Feed	337 lbs.	42604	272.60

Prices do not include incandescent lamps. **Dimensions,** section 613. **Angle Adapters,** section 608, page 10.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes illustration or price changes.

CROUSE-HINDS

Four-Section Square Non-Adjustable Traffic Signals

With Red, Amber, Green, and "Special"★★ Unlettered Combination Lenses‡

Fig. 1
Type TSP-224D Two-Way (180°) Signal
4-Inch Post Mounting
Underground Feed

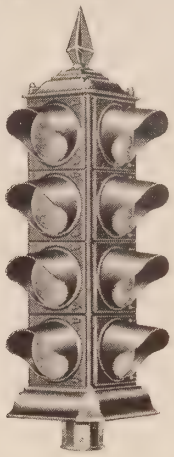
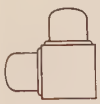


Fig. 2
Type TIP-224D Two-Way (90°) Signal
4-Inch Post Mounting with Base Light
Underground Feed

Fig. 3
Type TSV-224D Two-Way (90°) Signal
Vertical Bracket-Arm Mounting

Two-Way (90°), Four-Section Non-Adjustable Signals



Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TSW-224D	Span Wire	91 lbs.	42605	$146.00
TIW-224D	Span Wire with Base Light	96 lbs.	42606	158.00
TSM-224D	Mast Arm	96 lbs.	42607	150.60
TIM-224D	Mast Arm with Base Light	101 lbs.	42608	162.60
TSV-224D	Vertical-Bracket Arm, less Pole Clamps	96 lbs.	42609	148.00★
TSP-224D UG	4-Inch Post, Underground Feed	115 lbs.	42610	149.20
TSP-224D OH	4-Inch Post, Overhead Feed	116 lbs.	42611	152.60
TIP-224D UG	4-Inch Post with Base Light, Underground Feed	144 lbs.	42612	165.20
TIP-224D OH	4-Inch Post with Base Light, Overhead Feed	145 lbs.	42613	168.60
TSU-224D UG	1½-Inch Nipple, Underground Feed	89 lbs.	42614	143.80
TSU-224D OH	1½-Inch Nipple, Overhead Feed	90 lbs.	42615	147.20
TSA-224D UG	Pedestal with Base Light, Underground Feed	329 lbs.	42616	259.20
TSA-224D OH	Pedestal with Base Light, Overhead Feed	330 lbs.	42617	262.60

Two-Way (180°), Four-Section Non-Adjustable Signals

TSW-224D	Span Wire	91 lbs.	42618	$146.00
TIW-224D	Span Wire with Base Light	96 lbs.	42619	158.00
TSM-224D	Mast Arm	96 lbs.	42620	150.60
TIM-224D	Mast Arm with Base Light	101 lbs.	42621	162.60
TSV-224D	Vertical-Bracket Arm, less Pole Clamps	96 lbs.	42622	148.00★
TSP-224D UG	4-Inch Post, Underground Feed	115 lbs.	42623	149.20
TSP-224D OH	4-Inch Post, Overhead Feed	116 lbs.	42624	152.60
TIP-224D UG	4-Inch Post with Base Light, Underground Feed	144 lbs.	42625	165.20
TIP-224D OH	4-Inch Post with Base Light, Overhead Feed	145 lbs.	42626	168.60
TSU-224D UG	1½-Inch Nipple, Underground Feed	89 lbs.	42627	143.80
TSU-224D OH	1½-Inch Nipple, Overhead Feed	90 lbs.	42628	147.20
TSA-224D UG	Pedestal with Base Light, Underground Feed	329 lbs.	42629	259.20
TSA-224D OH	Pedestal with Base Light, Overhead Feed	330 lbs.	42630	262.60

Prices do not include incandescent lamps. **Dimensions,** section 613. **Angle Adapters,** section 608, page 10.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

★★Specify type of lens desired in fourth section. See section 608, page 2.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price changes.

CROUSE-HINDS

Four-Section Square Non-Adjustable Traffic Signals

With Red, Amber, Green, and "Special"★★ Unlettered Combination Lenses‡

Fig. 4
Type TIP-444D Four-Way Signal
With Base Light
4-Inch Post Mounting

Fig. 5
Type TSW-444D Four-Way Signal
Span-Wire Mounting

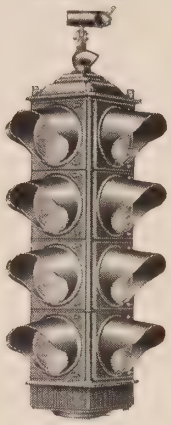
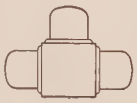


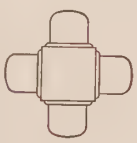
Fig. 6
Type TIM-444D Four-Way Signal
With Base Light
Mast-Arm Mounting

Three-Way, Four-Section Non-Adjustable Signals



Type	Mounting	Net Wt.	Cat. No.	List, each‡•
TSW-334D	Span Wire	105 lbs.	42631	$174.00
TIW-334D	Span Wire with Base Light	110 lbs.	42632	186.00
TSM-334D	Mast Arm	110 lbs.	42633	178.60
TIM-334D	Mast Arm with Base Light	115 lbs.	42634	190.60
TSV-334D	Vertical-Bracket Arm, less Pole Clamps	110 lbs.	42635	176.00★
TSP-334D UG	4-Inch Post, Underground Feed	129 lbs.	42636	177.20
TSP-334D OH	4-Inch Post, Overhead Feed	130 lbs.	42637	180.60
TIP-334D UG	4-Inch Post with Base Light, Underground Feed	158 lbs.	42638	193.20
TIP-334D OH	4-Inch Post with Base Light, Overhead Feed	159 lbs.	42639	196.60
TSU-334D UG	1½-Inch Nipple, Underground Feed	103 lbs.	42640	171.80
TSU-334D OH	1½-Inch Nipple, Overhead Feed	104 lbs.	42641	175.20
TSA-334D UG	Pedestal with Base Light, Underground Feed	344 lbs.	42642	287.20
TSA-334D OH	Pedestal with Base Light, Overhead Feed	345 lbs.	42643	290.60

Four-Way, Four-Section Non-Adjustable Signals



TSW-444D	Span Wire	120 lbs.	42644	$202.00
TIW-444D	Span Wire with Base Light	125 lbs.	42645	214.00
TSM-444D	Mast Arm	125 lbs.	42646	206.60
TIM-444D	Mast Arm with Base Light	130 lbs.	42647	218.60
TSV-444D	Vertical-Bracket Arm, less Pole Clamps	125 lbs.	42648	204.00★
TSP-444D UG	4-Inch Post, Underground Feed	144 lbs.	42649	205.20
TSP-444D OH	4-Inch Post, Overhead Feed	145 lbs.	42650	208.60
TIP-444D UG	4-Inch Post with Base Light, Underground Feed	173 lbs.	42651	221.20
TIP-444D OH	4-Inch Post with Base Light, Overhead Feed	174 lbs.	42652	224.60
TSU-444D UG	1½-Inch Nipple, Underground Feed	118 lbs.	42653	199.80
TSU-444D OH	1½-Inch Nipple, Overhead Feed	119 lbs.	42654	203.20
TSA-444D UG	Pedestal with Base Light, Underground Feed	359 lbs.	42655	315.20
TSA-444D OH	Pedestal with Base Light, Overhead Feed	360 lbs.	42656	318.60

Prices do not include incandescent lamps. **Dimensions,** section 613. **Angle Adapters,** section 608, page 10.

Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

★★Specify type of lens desired in fourth section. See section 608, page 2.

‡Prices include unlettered lenses in all sections. For each unlettered lens changed to a lettered lens or to an arrow lens, add $1.00 to the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

•Denotes price changes.

CROUSE-HINDS

One-Section Square Non-Adjustable Beacons

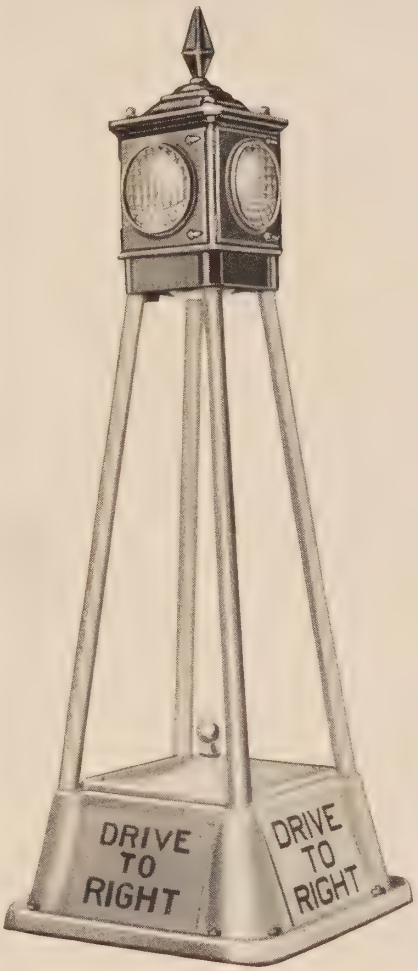


Fig. 1
Type TSA-441D
Electric Beacon with Base Light
Pedestal Mounting

Fig. 2
Type TSW-441D
Electric Beacon
Span-Wire Mounting

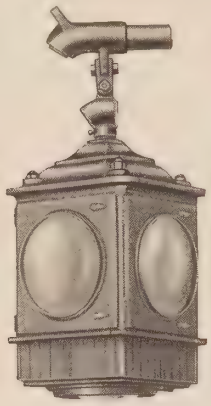


Fig. 3•
Type TIM-441D
Electric Beacon
With Base Light
Mast-Arm Mounting

The Crouse-Hinds Company has developed a line of electric beacons to serve as warnings at intersections which are physically dangerous and where the traffic is not dense enough to warrant the use of the regular three-color traffic signal. These beacons, installed at blind corners, unexpected dead-end streets, bad curves, steep hills, and fire stations, serve as unmistakable warnings to traffic.

Beacons are listed for mounting on a pedestal, 4-inch pipe, mast arm, or span wire.

The pedestal-type electric beacon is also used to good advantage on loading platforms for street car lines. When installed in this manner the lamp in the side of the beacon which throws light on the loading platform itself, does not flash but burns steadily.

The side lamps are flashed by the motor flashing switches listed and described on pages 5 and 6 of this section.

Electric flashing beacons are designed to use the standard 60-watt, 115-volt, A21-bulb traffic signal lamp in the four sides, and the 50-watt, 115-volt, P19-bulb "Vibration Service" lamp in the base light. When an especially brilliant light is desired directly beneath the suspended beacon, or on the foundation of the pedestal-type beacon, the base light can be equipped with a special optical system taking the 200-watt, 115-volt, PS30-bulb lamp.

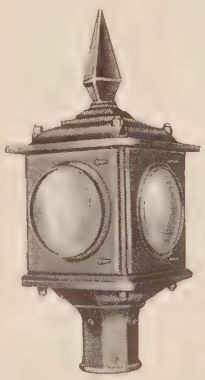


Fig. 4
Type TSP-441D
Electric Beacon
4-Inch Post Mounting

Fig. 5
Type TIP-441D
Electric Beacon
With Base Light
4-Inch Post Mounting

Standard Equipment•

Square Non-Adjustable Beacons: The beacons listed on pages 2, 2C, and 2D of this section are regularly furnished without hoods; but, if specified on the order, any of the hoods listed in section 608, page 10 will be furnished without extra charge. Beacons with sirens, for use adjacent to fire stations, are listed on pages 2C and 2D of this section.

Adjustable Beacons: The beacons listed on pages 2A and 2B of this section are regularly furnished with Cat. No. KL9 removable sheet aluminum hood. If specified on the order, any of the hoods listed in section 608, page 10 or the standard Crouse-Hinds door and hood cast in one unit will be furnished without extra charge. There is no deduction in the list prices for the omission of hoods.

Lenses: The faces of all beacons without sirens are regularly furnished with standard amber unlettered combination lenses while those equipped with sirens for installation adjacent to fire stations are equipped with red lenses. Unlettered combination or prismatic diffusing lenses of any desired color will be furnished without extra charge. See section 608, page 1.

Pedestal Mounted Beacons: Types TRA and TSA listed on pages 2, 2A, and 2B of this section include the beacon proper, four supporting legs, base casting with four information signs, eight cap nuts for $\frac{5}{8}$-inch foundation bolts, foundation plan, drawing for setting foundation bolts, and wiring diagram. Unless otherwise specified on the order, information signs reading "DRIVE TO RIGHT" will be furnished. Any of the 10 x 14-inch porcelain enameled information signs listed in section 608, page 8 will be supplied without extra charge, if specified on the order.

•Denotes addition or change in illustration.

CROUSE-HINDS

One-Section Square Non-Adjustable Beacons *Without Motor Flashing Switch*

With Amber Unlettered Combination Lenses‡

Two-Way (90°), One-Section Non-Adjustable Beacons

Type	Mounting	Net Wt.	Cat. No.	List, each•
TSW-221D	Span Wire	36 lbs.	42664	$ 50.00
TIW-221D	Span Wire with Base Light	41 lbs.	42665	62.00
TSM-221D	Mast Arm	41 lbs.	42666	54.60
TIM-221D	Mast Arm with Base Light	46 lbs.	42667	66.60
TSP-221D UG	4-Inch Post, Underground Feed	60 lbs.	42668	53.20★★
TSP-221D OH	4-Inch Post, Overhead Feed	61 lbs.	42669	56.60★★
TIP-221D UG	4-Inch Post with Base Light, Underground Feed	88 lbs.	42670	69.20
TIP-221D OH	4-Inch Post with Base Light, Overhead Feed	89 lbs.	42671	72.60
TSA-221D UG	Pedestal with Base Light, Underground Feed	274 lbs.	42672	163.20
TSA-221D OH	Pedestal with Base Light, Overhead Feed	275 lbs.	42673	166.60

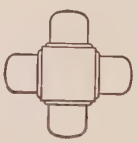
Two-Way (180°), One-Section Non-Adjustable Beacons

Type	Mounting	Net Wt.	Cat. No.	List, each•
TSW-221D	Span Wire	36 lbs.	42674	$ 50.00
TIW-221D	Span Wire with Base Light	41 lbs.	42675	62.00
TSM-221D	Mast Arm	41 lbs.	42676	54.60
TIM-221D	Mast Arm with Base Light	46 lbs.	42677	66.60
TSP-221D UG	4-Inch Post, Underground Feed	60 lbs.	42678	53.20★★
TSP-221D OH	4-Inch Post, Overhead Feed	61 lbs.	42679	56.60★★
TIP-221D UG	4-Inch Post with Base Light, Underground Feed	88 lbs.	42680	69.20
TIP-221D OH	4-Inch Post with Base Light, Overhead Feed	89 lbs.	42681	72.60
TSA-221D UG	Pedestal with Base Light, Underground Feed	274 lbs.	42682	163.20
TSA-221D OH	Pedestal with Base Light, Overhead Feed	275 lbs.	42683	166.60

Three-Way, One-Section Non-Adjustable Beacons

Type	Mounting	Net Wt.	Cat. No.	List, each•
TSW-331D	Span Wire	39 lbs.	42684	$ 57.00
TIW-331D	Span Wire with Base Light	44 lbs.	42685	69.00
TSM-331D	Mast Arm	44 lbs.	42686	61.60
TIM-331D	Mast Arm with Base Light	49 lbs.	42687	73.60
TSP-331D UG	4-Inch Post, Underground Feed	63 lbs.	42688	60.20★★
TSP-331D OH	4-Inch Post, Overhead Feed	64 lbs.	42689	63.60★★
TIP-331D UG	4-Inch Post with Base Light, Underground Feed	92 lbs.	42690	76.20
TIP-331D OH	4-Inch Post with Base Light, Overhead Feed	93 lbs.	42691	79.60
TSA-331D UG	Pedestal with Base Light, Underground Feed	278 lbs.	42692	170.20
TSA-331D OH	Pedestal with Base Light, Overhead Feed	279 lbs.	42693	173.60

Four-Way, One-Section Non-Adjustable Beacons



Type	Mounting	Net Wt.	Cat. No.	List, each•
TSW-441D	Span Wire	43 lbs.	42694	$ 64.00
TIW-441D	Span Wire with Base Light	48 lbs.	42695	76.00
TSM-441D	Mast Arm	48 lbs.	42696	68.60
TIM-441D	Mast Arm with Base Light	53 lbs.	42697	80.60
TSP-441D UG	4-Inch Post, Underground Feed	67 lbs.	42698	67.20★★
TSP-441D OH	4-Inch Post, Overhead Feed	68 lbs.	42699	70.60★★
TIP-441D UG	4-Inch Post with Base Light, Underground Feed	95 lbs.	42700	83.20
TIP-441D OH	4-Inch Post with Base Light, Overhead Feed	96 lbs.	42701	86.60
TSA-441D UG	Pedestal with Base Light, Underground Feed	286 lbs.	42702	177.20
TSA-441D OH	Pedestal with Base Light, Overhead Feed	287 lbs.	42703	180.60

Prices do not include incandescent lamps, motor flashing switches, or radio interference suppressors.

If hoods are required, they will be furnished without extra charge. See section 608, page 10.

★★Beacons for 1½-inch nipple mounting can be furnished, instead of 4-inch post mounting, at a decrease of $5.40 in the list prices.

‡Lenses of any standard color can be obtained without extra charge. Lettered lenses can be furnished at an advance of $1.00 per lens in the list price. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

Dimensions, section 613. **Signs and Sign Holders,** section 608, pages 7 and 8. **Angle Adapters,** section 608, page 10.

•Denotes price changes.

CROUSE-HINDS

One-Section Adjustable Beacons *Without Motor Flashing Switch*

With Amber Unlettered Combination Lenses‡

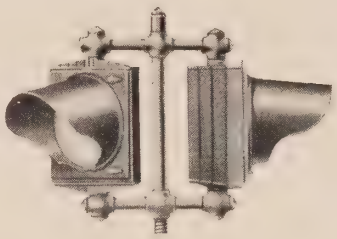


Fig. 1
Type TRU-221D Two-Way Beacon
1½-Inch Nipple Mounting
Underground Feed

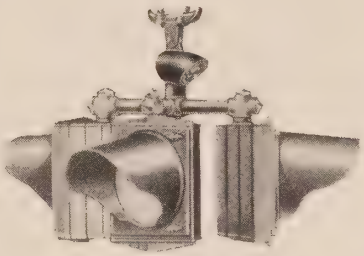


Fig. 2
Type TRW-331D Three-Way Beacon
Span-Wire Mounting

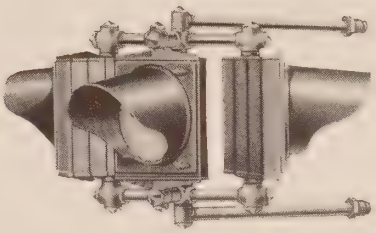
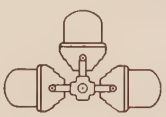


Fig. 3
Type TRV-331D Three-Way Beacon
Vertical Bracket-Arm Mounting

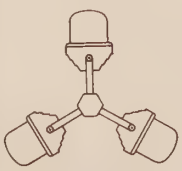
Two-Way, One-Section Adjustable Beacons

Type	Mounting	Net Wt.	Cat. No.	List, each
TRW-221D	Span Wire with Top Arm Assembly Only . . .	45 lbs.	46214	$ 45.40§
TRM-221D	Mast Arm with Top Arm Assembly Only . . .	50 lbs.	46215	50.00§
TRV-221D	Vertical-Bracket Arm, less Pole Clamps	42 lbs.	46216	52.00★
TTV-221D	Tandem-Bracket Arm, less Pole Clamps	32 lbs.	46217	52.00★
TRP-221D UG	4-Inch Post, Underground Feed	54 lbs.	46218	51.00
TRP-221D OH	4-Inch Post, Overhead Feed	60 lbs.	46219	55.60
TIRP-221D UG	4-Inch Post with Base Light, Underground Feed	64 lbs.	46220	67.00
TIRP-221D OH	4-Inch Post with Base Light, Overhead Feed. .	70 lbs.	46221	71.60
TRU-221D UG	1½-Inch Nipple, Underground Feed	39 lbs.	46222	46.60
TRU-221D OH	1½-Inch Nipple, Overhead Feed	45 lbs.	46223	51.20
TRA-221D UG	Pedestal with Base Light, Underground Feed .	289 lbs.	46224	166.00
TRA-221D OH	Pedestal with Base Light, Overhead Feed . . .	295 lbs.	46225	170.60

Three-Way, One-Section Adjustable Beacons



90° Mounting



120° Mounting

Type	Mounting	Net Wt.	Cat. No.	List, each
TRW-331D	Span Wire with Top Arm Assembly Only . . .	67 lbs.	46226	$ 66.10§
TRM-331D	Mast Arm with Top Arm Assembly Only . . .	72 lbs.	46227	70.70§
TRV-331D	Vertical-Bracket Arm, less Pole Clamps	64 lbs.	46228	75.00★
TRP-331D UG	4-Inch Post, Underground Feed	75 lbs.	46229	74.00
TRP-331D OH	4-Inch Post, Overhead Feed	81 lbs.	46230	78.60
TIRP-331D UG	4-Inch Post with Base Light, Underground Feed	85 lbs.	46231	92.00
TIRP-331D OH	4-Inch Post with Base Light, Overhead Feed. .	91 lbs.	46232	96.60
TRU-331D UG	1½-Inch Nipple, Underground Feed	61 lbs.	46233	69.60
TRU-331D OH	1½-Inch Nipple, Overhead Feed	67 lbs.	46234	74.20
TRA-331D UG	Pedestal with Base Light, Underground Feed .	312 lbs.	46235	189.00
TRA-331D OH	Pedestal with Base Light, Overhead Feed . . .	318 lbs.	46236	193.60

Prices do not include incandescent lamps, motor flashing switches, or radio interference suppressors.

Adjustable beacons are regularly furnished with detachable hoods. No deduction in price for the omission of hoods. Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Lenses of any standard color can be obtained without extra charge. Lettered lenses can be furnished at an advance of $1.00 per lens in the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

§If base light is required, add $16.00 to the list price of the beacon.

Dimensions, section 613. **Signs and Sign Holders,** section 608, pages 7 and 8.

CROUSE-HINDS

One-Section Adjustable Beacons *Without Motor Flashing Switch*

With Amber Unlettered Combination Lenses‡

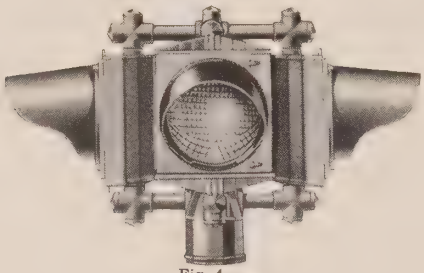


Fig. 4
Type TRP-441D Four-Way Beacon
4-Inch Post Mounting

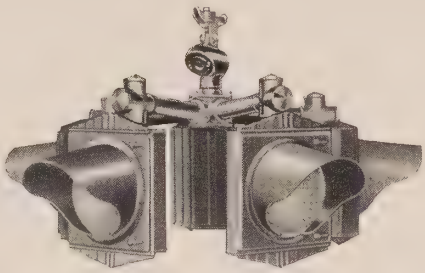
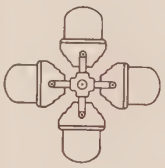


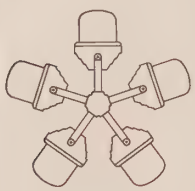
Fig. 5
Type TRW-551D Five-Way Beacon
Span-Wire Mounting

Four-Way, One-Section Adjustable Beacons



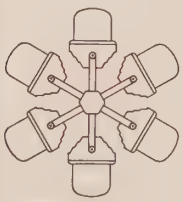
Type	Mounting	Net Wt.	Cat. No.	List, each
TRW-441D	Span Wire with Top Arm Assembly Only . . .	89 lbs.	46237	$ 86.80§
TRM-441D	Mast Arm with Top Arm Assembly Only . . .	94 lbs.	46238	91.40§
TRV-441D	Vertical-Bracket Arm, less Pole Clamps	86 lbs.	46239	98.00★
TRP-441D UG	4-Inch Post, Underground Feed	98 lbs.	46240	97.00
TRP-441D OH	4-Inch Post, Overhead Feed	104 lbs.	46241	101.60
TIRP-441D UG	4-Inch Post with Base Light, Underground Feed	108 lbs.	46242	113.00
TIRP-441D OH	4-Inch Post with Base Light, Overhead Feed. .	114 lbs.	46243	117.60
TRU-441D UG	1½-Inch Nipple, Underground Feed	83 lbs.	46244	92.60
TRU-441D OH	1½-Inch Nipple, Overhead Feed	89 lbs.	46245	97.20
TRA-441D UG	Pedestal with Base Light, Underground Feed .	336 lbs.	46246	212.00
TRA-441D OH	Pedestal with Base Light, Overhead Feed . . .	342 lbs.	46247	216.60

Five-Way, One-Section Adjustable Beacons



TRW-551D	Span Wire with Top Arm Assembly Only . . .	151 lbs.	46248	$107.50§
TRM-551D	Mast Arm with Top Arm Assembly Only . . .	156 lbs.	46249	112.10§
TRP-551D UG	4-Inch Post, Underground Feed	160 lbs.	46250	127.00
TRP-551D OH	4-Inch Post, Overhead Feed	166 lbs.	46251	131.60
TIRP-551D UG	4-Inch Post with Base Light, Underground Feed	173 lbs.	46252	143.00
TIRP-551D OH	4-Inch Post with Base Light, Overhead Feed. .	179 lbs.	46253	147.60
TRA-551D UG	Pedestal with Base Light, Underground Feed .	370 lbs.	46254	235.00
TRA-551D OH	Pedestal with Base Light, Overhead Feed . . .	376 lbs.	46255	239.60

Six-Way, One-Section Adjustable Beacons



TRW-661D	Span Wire with Top Arm Assembly Only . . .	173 lbs.	46256	$128.20§
TRM-661D	Mast Arm with Top Arm Assembly Only . . .	178 lbs.	46257	132.80§
TRP-661D UG	4-Inch Post, Underground Feed	182 lbs.	46258	150.00
TRP-661D OH	4-Inch Post, Overhead Feed.	188 lbs.	46259	154.60
TIRP-661D UG	4-Inch Post with Base Light, Underground Feed	195 lbs.	46260	166.00
TIRP-661D OH	4-Inch Post with Base Light, Overhead Feed. .	201 lbs.	46261	170.60
TRA-661D UG	Pedestal with Base Light, Underground Feed .	400 lbs.	46262	258.00
TRA-661D OH	Pedestal with Base Light, Overhead Feed . . .	406 lbs.	46263	262.60

Prices do not include incandescent lamps, motor flashing switches, or radio interference suppressors.

Adjustable beacons are regularly furnished with detachable hoods. No deduction in price for the omission of hoods. Special detachable hoods not exceeding 8 inches in length will be furnished without extra charge. Hoods exceeding 8 inches in length, add $2.00 per hood. See section 608, page 10.

★Price does not include pole clamps; listed separately in section 608, page 5.

‡Lenses of any standard color can be obtained without extra charge. Lettered lenses can be furnished at an advance of $1.00 per lens in the list prices. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

§If base light is required, add $16.00 to the list price of the beacon.

Dimensions, section 613. **Signs and Sign Holders,** section 608, pages 7 and 8.

CROUSE-HINDS

One-Section Square Non-Adjustable Beacons With Siren

For Use Adjacent to Fire Stations

Fig. 1
Type TSWS-441D
Beacon with Siren
Span-Wire Mounting

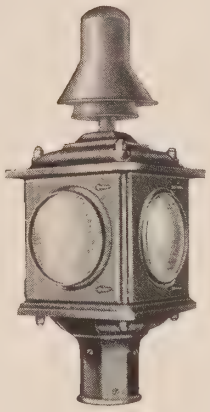


Fig. 2
Type TSPS-441D
Beacon with Siren
4-Inch Post Mounting

Fig. 3
Type TIPS-441D
Beacon with Siren
and Base Light
4-Inch Post Mounting

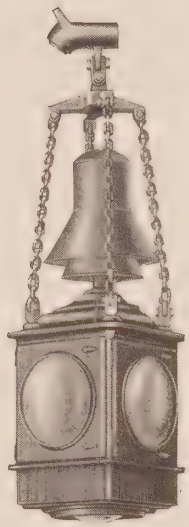


Fig. 4
Type TIMS-441D
Beacon with Siren
and Base Light
Mast-Arm Mounting

In responding to a fire alarm, split seconds count. The success or failure of the Fire Department often depends upon its promptness in getting to the fire. Even slight delays to the fire apparatus, caused by traffic in front of or adjacent to fire stations, may materially affect the Fire Department's relentless war on fire.

To assist the Fire Department in getting to the scene of the fire in the shortest possible time, the Crouse-Hinds Company has designed a complete line of beacons equipped with sirens. These beacons are installed on the street in front of the fire stations and are operated just as the fire apparatus comes out. The lights of the beacon give a visual signal and the powerful siren sends an audible signal to clear traffic so that the apparatus may speed on its way without delay.

Powerful ¼-horsepower "Federal" or "Sterling" sirens are securely fastened to the top of the Crouse-Hinds beacons, and the combination may be installed as a single unit, thus saving installation expense.

These combination beacons and sirens may be controlled by various methods. Simplest and cheapest is by means of a manually operated switch within the fire house, operated by one of the firemen. In small fire stations where every man in the station goes with the apparatus, it is advisable to use a time limiting switch so that the beacon and siren may be turned off after the apparatus has cleared the station. For this purpose, the Crouse-Hinds Company lists in section 602, page 7 of this section, the type AE-2 automatic reset variable timing relay, and type ME-1 manually operated, self-restoring emergency switch. Either of these relays will open the circuit after a predetermined time.

Listed on page 2D of this section are two, three, and four-way electric beacons complete with sirens for mounting on a span wire, mast arm, or a 4-inch post.

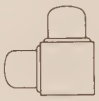
CROUSE-HINDS

One-Section Square Non-Adjustable Beacons With Siren

Without Motor Flashing Switch

For Use Adjacent to Fire Stations — With Red Unlettered Combination Lenses‡

Two-Way (90°), One-Section Non-Adjustable Beacons

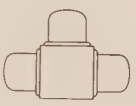


Type	Mounting	Net Wt.	Cat. No.	List, each
TSWS-221D	Span Wire	62 lbs.	46348	$120.00
TIWS-221D	Span Wire with Base Light	67 lbs.	46349	132.00
TSMS-221D	Mast Arm	67 lbs.	46350	124.60
TIMS-221D	Mast Arm with Base Light	72 lbs.	46351	136.60
TSPS-221D UG	4-Inch Post, Underground Feed	75 lbs.	46352	108.00★★
TIPS-221D UG	4-Inch Post with Base Light, Underground Feed	104 lbs.	46353	124.00

Two-Way (180°), One-Section Non-Adjustable Beacons

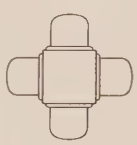
Type	Mounting	Net Wt.	Cat. No.	List, each
TSWS-221D	Span Wire	62 lbs.	46354	$120.00
TIWS-221D	Span Wire with Base Light	67 lbs.	46355	132.00
TSMS-221D	Mast Arm	67 lbs.	46356	124.60
TIMS-221D	Mast Arm with Base Light	72 lbs.	46357	136.60
TSPS-221D UG	4-Inch Post, Underground Feed	75 lbs.	46358	108.00★★
TIPS-221D UG	4-Inch Post with Base Light, Underground Feed	104 lbs.	46359	124.00

Three-Way, One-Section Non-Adjustable Beacons



Type	Mounting	Net Wt.	Cat. No.	List, each
TSWS-331D	Span Wire	65 lbs.	46360	$127.00
TIWS-331D	Span Wire with Base Light	70 lbs.	46361	139.00
TSMS-331D	Mast Arm	70 lbs.	46362	131.60
TIMS-331D	Mast Arm with Base Light	75 lbs.	46363	143.60
TSPS-331D UG	4-Inch Post, Underground Feed	78 lbs.	46364	115.00★★
TIPS-331D UG	4-Inch Post with Base Light, Underground Feed	107 lbs.	46365	131.00

Four-Way, One-Section Non-Adjustable Beacons



Type	Mounting	Net Wt.	Cat. No.	List, each
TSWS-441D	Span Wire	69 lbs.	46366	$134.00
TIWS-441D	Span Wire with Base Light	74 lbs.	46367	146.00
TSMS-441D	Mast Arm	74 lbs.	46368	138.60
TIMS-441D	Mast Arm with Base Light	79 lbs.	46369	150.60
TSPS-441D UG	4-Inch Post, Underground Feed	82 lbs.	46370	122.00★★
TIPS-441D UG	4-Inch Post with Base Light, Underground Feed	110 lbs.	46371	138.00

Prices do not include incandescent lamps, motor flashing switches, or radio interference suppressors.
If hoods are required, they will be furnished without extra charge. See section 608, page 10.
★★Beacons for 1½-inch nipple mounting can be furnished, instead of 4-inch post mounting, at a decrease of $5.40 in the list prices.
‡Lenses of any standard color can be obtained without extra charge. Lettered lenses can be furnished at an advance of $1.00 per lens in the list price. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.
Dimensions, section 613. **Signs and Sign Holders,** section 608, pages 7 and 8. **Angle Adapters,** section 608, page 10.

CROUSE-HINDS

One-Way, One-Section Beacons and Signals *Without Motor Flashing Switch*

With Amber Unlettered Type T or "Special" Lenses‡

Fig. 1
Type TSU-111D One-Way
One-Section Beacon
1½-Inch Nipple Mounting

Fig. 2
Type TSP-111D One-Way
One-Section Beacon
4-Inch Post Mounting

Fig. 3
Type TSE-111D One-Way
One-Section Signal
With "WALK" Lens

Fig. 4●
Type TSE-111D One-Way
One-Section Signal
With Right "ARROW" Lens

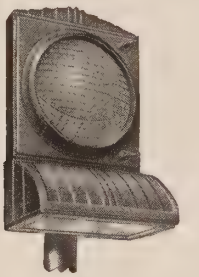


Fig. 5
Type TST-111D One-Way
One-Section Beacon
With Sign Reflector and
Glass Door

Fig. 6
Type TST-111D One-Way
One-Section Beacon
Installed on 2-Inch Post

Crouse-Hinds one-way, one-section beacons and signals are similar in all respects to standard traffic signals, except that they have only one section instead of the usual three.

All beacons except type TSE-111D are regularly equipped with amber, unlettered combination lenses. Type TSE-111D, Figs. 3 and 4 above, are equipped with "WALK" or "ARROW" lenses and are used for mounting beneath existing signals. They are furnished complete with 1¼-inch diameter pipe nipple, lead gasket, and check nuts.

Type TST-111D beacons, Figs. 5 and 6 above, are equipped with an auxiliary reflector and receptacle for illuminating an information or warning sign mounted on the supporting standard immediately below. Auxiliary reflector is designed to take any lamp not exceeding 3⅛ inches in diameter or 6$^{15}/_{16}$ inches in length. A standard 100-watt lamp is recommended. On the bottom of the type TST-111D beacon there is a slip fitter for 2-inch pipe, cast as a part of the beacon base. Set screws are provided for fastening it to the 2-inch supporting pipe.

Type	Mounting	Lens	Net Wt.	Cat. No.	List, each
TSO-111D	Without any Mounting Attachments	Amber	10 lbs.	46402	$16.00
TSW-111D	Span Wire	Amber	17 lbs.	42657	21.20
TSM-111D	Mast Arm	Amber	22 lbs.	42658	25.80
TSP-111D UG	4-Inch Post, Underground Feed	Amber	20 lbs.	42659	22.20
TSP-111D OH	4-Inch Post, Overhead Feed	Amber	26 lbs.	42660	25.60
TSU-111D UG	1½-Inch Nipple, Underground Feed	Amber	11 lbs.	42661	17.80
TSU-111D OH	1½-Inch Nipple, Overhead Feed	Amber	17 lbs.	42662	21.20
TSV-111D	Vertical Bracket with Top Arm only, less Pole Clamp	Amber	20 lbs.	42663	20.20★
TSE-111D	1¼-Inch Nipple in Top with Hood	"WALK"	11 lbs.	46372	18.80
TSE-111D	1¼-Inch Nipple in Top with Hood	Vertical Arrow	11 lbs.	46373	18.80
TSE-111D	1¼-Inch Nipple in Top with Hood	Right Arrow	11 lbs.	46374	18.80
TSE-111D	1¼-Inch Nipple in Top with Hood	Left Arrow	11 lbs.	46375	18.80
TST-111D UG	2-Inch Post with Sign Reflector and Glass Door	Amber	15 lbs.	46380	30.20●

Prices do not include incandescent lamps, motor flashing switches, or radio interference suppressors.

Beacons are furnished without hoods. Standard hoods, not exceeding 8 inches in length, will be furnished without extra charge. For hoods over 8 inches in length, add $3.00 to the list price.

★Price does not include pole clamp; listed separately in section 608, page 5.

‡Lenses of any standard color can be obtained without extra charge. Lettered lenses can be furnished at an advance of $1.00 per lens in the list price. For each lens omitted, deduct $1.00 from the list prices. See section 608, page 2.

Dimensions, section 613. ●Denotes change in illustration and price.

CROUSE-HINDS

Type RM-111 One-Way Beacons *Without Motor Flashing Switch*

With Amber Unlettered Combination Lens‡

Fig. 7
Type RM-111 One-Way Beacon
Span-Wire Mounting

Type RM-111 one-way beacons have substantial cast aluminum cases, well gasketed, making them dust-tight and weatherproof. They are widely used to mark safety zones, dead-end streets, and bridge approaches.

In the bottom of the casing there is mounted a lamp receptacle, properly located to bring the filament of the standard 60-watt traffic signal lamp to the focal point of the silvered glass parabolic reflector. The door, which is equipped with an 8⅜-inch diameter amber combination lens, is hinged at the top, gasketed, and fastened by three wing nuts. The top and bottom of the casing is drilled for ¾-inch conduit.

Fig. 8
Type RM-111 One-Way Beacon
Wall Mounting

Type	Mounting	Net Wt.	Cat. No.	List, each
RM-111	Span-Wire Mounting	32 lbs.	41594	$21.20
	Wall Mounting	30 lbs.	41597	18.00

Type WVW (360°) Fresnel Lens Beacons *Without Motor Flashing Switch*

With 6 or 8-Inch Amber Fresnel Lens‡

Fig. 9
Type WVW 6-Inch
150-Watt, 115-Volt Lamp

Type WVW (360°) beacons consist of either a 6 or 8-inch amber Fresnel lens, mounted in a suitable cast Feraloy weatherproof housing. In the top canopy there is mounted a lamp receptacle, correctly positioned to bring the lamp filament to the proper position within the lens. The 8-inch size takes a 200-watt, 115-volt, PS30-bulb lamp; and the 6-inch size takes a 150-watt, 115-volt, PS25-bulb lamp. If it is desired to use a smaller lamp, the order must so state, so that the lamp receptacle can be mounted in the correct position. These beacons concentrate the light of a lamp into a narrow band of small vertical divergence and distribute it throughout 360° in the horizontal plane, thus producing an exceptionally strong warning beacon visible in all directions.

In the bottom of the beacons there is a gasketed door which may be opened by loosening two wing nuts, thus providing means for relamping. In one style of beacon the door is blank, and in the other it is provided with a clear diffusing roundel, thus permitting light to be thrown downward directly beneath the beacon.

These beacons are furnished complete with wire outlet with two-wire cover, span-wire clamp, and spreader arms for power wires as illustrated.

Fig. 10
Type WVW 8-Inch
200-Watt, 115-Volt Lamp

Type	Description	Net Wt.	Cat. No.	List, each
WVW—6-Inch	With Bottom Diffusing Lens	15 lbs.	41598	$26.20
	With Blank Bottom Door	15 lbs.	41599	24.60
WVW—8-Inch	With Bottom Diffusing Lens	22 lbs.	41665	$29.60
	With Blank Bottom Door	22 lbs.	41600	26.80

Prices do not include incandescent lamps, motor flashing switches, or radio interference suppressors.
If span-wire hanger is not desired with type WVW, deduct $1.40 from the list prices.
‡Lenses of any standard color can be obtained without extra charge.
Dimensions, section 613.

CROUSE-HINDS

Type TSS-16 Motor Flashing Switches•

For All Types of Warning Beacons

115-Volt, 60-Cycle A. C.★

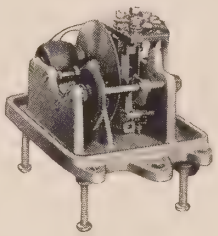


Fig. 1
Type TSS-16 Motor Flashing Switch
550 Watts—Metal Contacts
Cover Removed

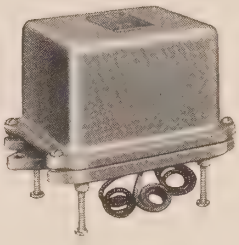


Fig. 2
Type TSS-16 Motor Flashing Switch

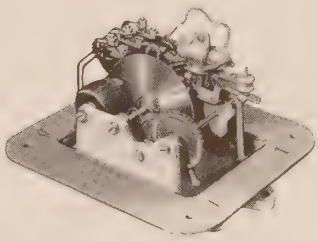


Fig. 3
Type TSS-16 Motor Flashing Switch
2000 Watts—Mercury Tube Contact
Cover Removed

The type TSS-16 motor flashing switch is made in two sizes: a small one having a capacity of 550 watts, and a large one having a capacity of 2000 watts. It consists of an induction-disc motor driving a cam shaft through a train of spur gearing. This motor flashing switch is very rugged and reliable in operation and will operate for long periods of time without attention. The type TSS-16 motor flashing switch is listed below for 115-volt, 60-cycle A. C. operation, but can be furnished for other voltages and frequencies.

The speed of flash may be varied between 10 times a minute and 40 times a minute. When shipped from the factory, the speed of flash is adjusted for 36 times a minute and this speed is recommended. The speed of flash is adjusted by rotating one of the pole faces. Special cams to give other speeds of flash can be furnished on special order. Consult the main office at Syracuse for information.

All bearings and shafts are designed to reduce the frictional load to a minimum. These switches should be oiled periodically. The Crouse-Hinds Company will furnish a suitable oil in small cans.

These switches are assembled to a rugged cast Feraloy base plate over which there is placed a cast Feraloy cover equipped with an asbestos gasket, thus making the unit entirely weatherproof.

550-Watt Flasher with Metal Contacts: The 550-watt flasher is equipped with quick-make and quick-break, self-wiping, non-corrosive metal contacts identical with those which are used in the standard line of type D automatic timing switches. It is listed below for both single-circuit and for two-circuit operation. For two-circuit operation the two circuits are flashed alternately, one circuit being "On" while the other circuit is "Off" and vice versa.

This switch is suitable for mounting within the ornamental pedestal of Crouse-Hinds signals and controls. For mounting on a pole, the four legs shown in Figs. 1 and 2 may be removed.

2000-Watt Flasher with Mercury Tube Contact: This high capacity flasher employs a mercury tube contact having an inner lining which is practically indestructible. It is made for single-circuit operation only.

This flasher must be installed in an approximately level position. It should, therefore, rest on its base or be hung from the ring in the cover.

Radio Interference Suppressor: Type TSS-16 motor flashing switches are listed below with and without radio interference suppressors. Single-circuit flashers take Cat. No. 8816-B suppressor and two-circuit flashers take Cat. No. 8817-B suppressor. These radio interference suppressors are especially designed for Crouse-Hinds flashers and are the best obtainable.

Type	Description		550-Watt With Metal Contacts			2000-Watt With Mercury Tube Contact		
			Net Wt.	Cat. No.	List, each	Net Wt.	Cat. No.	List, each
TSS-16	Single-Circuit	With Suppressor	16	46377	$46.00	28	46379	$56.00
		Without Suppressor	15	45686	$38.00	27	45688	$46.00
	Two-Circuit	With Suppressor	16	46376	$52.00	..	†	
		Without Suppressor	15	46378	$42.00	..	†	

★Can be furnished for 230-volt, 60-cycle operation without extra charge. For other voltages and frequencies, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.
†Not Made.
•Denotes revised listing.

CROUSE-HINDS

Type TSS-18 Motor Flashing Switches

20 to 60 Flashes Per Minute

10-Ampere, 115-Volt, 60-Cycle A. C.★

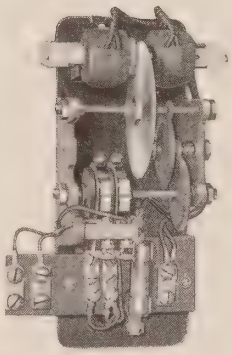


Fig. 4
Type TSS-18
Motor Flashing Switch

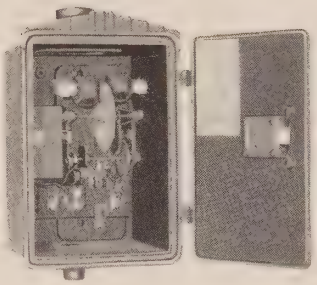


Fig. 5
Type TSS-18 Motor Flashing
Switch in Size 12 Cabinet
Door Open

Fig. 6
Size 12 Cabinet
Steel-Pole Mounting
With Adjustable Pole Bands

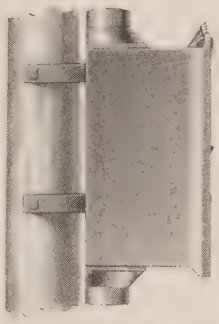


Fig. 7
Size 12 Cabinet
Wood-Pole Mounting
With Wood Pole Straps

Type TSS-18 motor flashing switch is a substantial, heavy duty flasher for use with all types of electrical warning beacons listed in this section. It has large diameter, widebreak, non-corrosive metal contacts and will handle an incandescent lamp load of 10 amperes. It is driven by a variable speed induction-disc motor, the magnetic circuit of which is laminated throughout, thus giving high torque at low wattage input. This motor flashing switch is very rugged and reliable in operation and will operate for long periods of time without attention.

The speed of flash may be varied between 20 times a minute and 60 times a minute. When shipped from the factory, the speed of flash is adjusted for approximately 60 times a minute with the duration of the "on" and "off" intervals approximately equal.

In addition to the motor flashing switch itself, a terminal block with properly identified terminals for all field connections is provided. A set of fuse clips for the hot side of the power line is mounted on the terminal block. These fuse clips will take a standard 30-ampere size N. E. C. cartridge fuse. Size of fuse should be selected to suit the load.

The entire switch assembly, including motor, gearing, cam shaft, terminal block, and radio interference suppressor when used, is mounted on a heavy cast metal frame which may be removed as a unit from the cabinet to facilitate installation. When shipped from the factory, the terminal block is near the bottom of the cabinet, but if desired, the entire switch assembly may be reversed to bring the terminal block to the top. There is ample room in the cabinet for all field wiring.

Cabinet: Type TSS-18 motor flashing switch is mounted in a size 12 cast aluminum, weatherproof cabinet, equipped with a heavy duty brass lock. The hinged door of the cabinet is equipped with a gasket to exclude dust and moisture.

Field wires may be brought into either the top or bottom of the cabinet as desired, since the cabinet is equipped with removable hub plates to take any size threaded conduit from ½ to 2-inch diameter. Cabinets are regularly furnished with 1-inch hub plates on the top and bottom, but if specified on the order, any size hub plates between ½ and 2 inches will be furnished without extra charge. Standard mounting attachments are shown in Figs. 6 and 7.

Radio Interference Suppressor: Type TSS-18 motor flashing switches are listed below with and without radio interference suppressors. Single-circuit flashers take Cat. No. 8816-B suppressor. Two-circuit flashers take Cat. No. 8817-B suppressor. These radio interference suppressors are especially designed for Crouse-Hinds flashers and are the best obtainable.

Grounding: Flashers should be grounded. In the bottom of the cabinet near the rear wall, there is provided a hole tapped for ½-inch pipe, into which may be screwed either a ground rod connector or a piece of ½-inch conduit. When shipped from the factory a removable plug is screwed into this hole.

Type	Description		Net Wt.	Steel-Pole Mounting§		Wood-Pole Mounting§	
				Cat. No.	List, each	Cat. No.	List, each
TSS-18	Single-Circuit	With Suppressor	24 lbs.	42719	$46.00	46411	$46.00
		Without Suppressor	23 lbs.	42717	$38.00	46412	$38.00
	Two-Circuit	With Suppressor	24 lbs.	42720	$52.00	46413	$52.00
		Without Suppressor	23 lbs.	42718	$42.00	46414	$42.00

★Can be furnished for 230-volt, 60-cycle operation without extra charge. For other voltages and frequencies, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

§Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Special mounting attachments for steel-pole mounting are listed in section 608, page 5.

CROUSE-HINDS

Radio Interference Suppressor

Radio interference suppressors are especially designed for use with Crouse-Hinds motor flashing switches listed in this section, and are also used on the flashing circuit of all Crouse-Hinds traffic signal timers. They are small and compact, measuring only 4 x 2 x 1 7/16 inches, and can be mounted in standard flasher and timer cabinets.

These radio interference suppressors have been specifically developed to suppress radio noises from Crouse-Hinds equipment when found objectionable, and in general will reduce such disturbances to a minimum. Since there are so many factors which may cause radio interference, it may be found that such interference cannot be reduced below an objectionable limit, without special equipment. However, it has been our experience that these suppressors are entirely satisfactory in the great majority of installations.

Description	For Use With	Cat. No.•	List, each
Single-Circuit	Type D Controls and Single-Circuit Flashers	8816-B	$ 8.00
Single-Circuit	Type G Controls Only	8818-B	8.00
Two-Circuit	Two-Circuit Flashers Only	8817-B	10.00

Type AE-2 Automatic Reset Variable Timing Relay•

10 to 300 Seconds **For Emergency Fire Signal** **115-Volt, 60-Cycle A. C.**

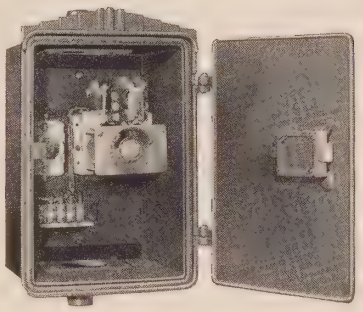


Fig. 1
Type AE-2
Automatic Reset Variable Timing Relay

Type AE-2 relay is for use in timing the duration of the emergency all-red fire signal where it is desired to operate the "Emergency Signal" for a given length of time and then restore normal operation. It has a range of from 10 to 300 seconds, controlled by adjusting the lever on the dial. (If specified in the order, this relay can be furnished with a range of from 2 to 20 minutes.) The relay is set in operation by pushing a momentary contact switch which may be located at any convenient point. The closing of the momentary contact switch automatically closes the motor circuit in the relay, which circuit operates the motor and remains closed during the selected time delay interval. The motor then comes to rest and the relay automatically resets itself for the next operation. Type AE-2 relay is mounted in a cast metal cabinet as illustrated.

Type AE-2 is listed below less cabinet for inclusion in a master timer, and is also listed mounted in a size 12 weatherproof cabinet. Both listings include a separate ED185 Condulet with push button switch.

Description	Cat. No.	List, each
Type AE-2 Relay, Single Circuit, less Cabinet, with Push Button	46406	$50.00
Type AE-2 Relay, Single Circuit, with Size 12 Cabinet and Push Button	46407	63.00

Type ME-1 Manually Operated, Self-Restoring Emergency Switch

30 or 60 Seconds **For Emergency Fire Signal** **115-Volt, 60-Cycle A. C.**

Fig. 2
Type ME-1 Manually Operated,
Self-Restoring Emergency Switch

Type ME-1 emergency fire signal switch is operated manually by pulling down the handle, shown in the illustration to the left. When pulled down, the handle trips the mechanism and, through a relay, turns the signals red for a pre-determined time and then restores normal operation and automatically resets itself for the next emergency.

This switch is used largely in connection with signals installed outside of fire houses to warn the public that the apparatus is coming out. It can be obtained for operating periods of either 30 or 60 seconds; the desired period must be specified on the order. The box in which the switch is installed has a gasketed cover and is weatherproof. A ¾-inch conduit hub is provided in the bottom.

Description	Cat. No.	List, each
Type ME-1 Manually Operated Emergency Switch	45938	$42.00

Dimensions, section 613.
•Denotes addition or revised listing.

CROUSE-HINDS

CROUSE-HINDS

Automatic Timing Switches•

Type DA-21 Variable — **Types DSG-21 and DSG-2105 Gear Shift Synchronous**

For Isolated Intersections and Simultaneous or Alternate Traffic Control Systems

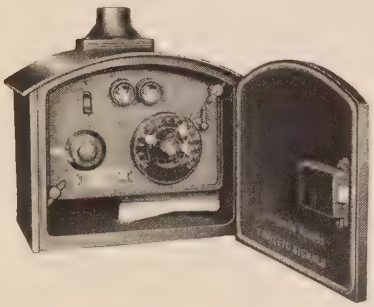


Fig. 1
Type DA-21 Automatic Variable
Timing Switch in Size 11 Cabinet
Door Open showing Dials for Controlling Timing Intervals

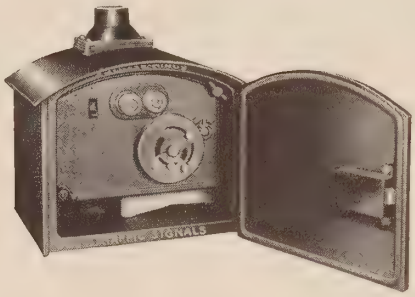


Fig. 2
Types DSG-21 and DSG-2105 Automatic Gear Shift Synchronous
Timing Switch in Size 11 Cabinet
Door Open showing Dials for Controlling Signal Operation

Crouse-Hinds types DA-21, DSG-21, and DSG-2105 automatic timing switches are similar in design and construction, and differ only in their total time-cycle characteristics. Type DA-21 is a variable control for use at an isolated intersection; or by the use of relay stations, it may be used to control a large number of intersections to give a simultaneous or alternate system of coordination. Types DSG-21 and DSG-2105 are synchronous and may be used for obtaining simultaneous, alternate, or limited-progressive systems of coordination without the use of interconnecting wires.

All Crouse-Hinds automatic timing switches have a rating of 10 amperes at 115 volts, and will carry the load of four four-way signals or sixteen one-way signals. When more signals are connected directly to controls, the useful life of the contacts is shortened. Cascade relay boxes installed at convenient locations will carry the excess load. These boxes are listed on page 7 of this section.

Type DA-21 Timing Switch—Variable

Type DA-21 automatic variable timing switch is driven by a variable speed, induction-disc motor and has a variable total period or time cycle. In the standard DA-21 controls, listed on page 4 of this section, the time cycle may be varied from 40 to 120 seconds, simply by turning the graduated total period dial to the desired point. If specified on the order, DA-21 variable controls will be furnished with a total period variable from 30 to 90 seconds, or from 20 to 60 seconds. The price of both these controls is the same as for the standard.

Synchronous Timing Switches—Types DSG-21 and DSG-2105

The synchronous motor as a time-keeping device is well known and understood. It is accurate and dependable, since it always keeps in step with the frequency of the supply circuit, and if several of these motors are placed on the same supply circuit, they will maintain their exact time relationship. This inherent speed control characteristic of synchronous motors has been used by the Crouse-Hinds Company in developing a line of automatic synchronous timing switches for controlling traffic signals. These timing switches, with no interconnecting cable, other than the ordinary distribution system of the central station, can be used to give a simultaneous, an alternate, or a limited-progressive movement of traffic. A traffic signal system operated by synchronous motor-driven timing switches without interconnecting wires has all of the advantages of the interconnected system, except central control of the total period, and the signals must be shut down, or set for flashing or steady amber locally. However, this is of no great disadvantage since the officer on duty can readily shut down the signals at night and start them again in the morning, when they will immediately go into their proper time relationship.

The Crouse-Hinds Company has developed two different types of automatic synchronous timing switches: type DSG-21 and type DSG-2105 with built-in gear shifts which will give several different total periods.

Type DSG-21 Gear Shift Synchronous Timing Switch—Adjustable Total Period

Type DSG-21 is an adjustable speed automatic synchronous timing switch with a gear shift built into the timer mechanism, by means of which it is possible to obtain several different total periods, merely by meshing the proper gears. This switch has a range of from 40 to 80 seconds total period, in steps of 10 seconds each. The change from one total period to the other may be accomplished within a few seconds' time without removing the timing switch from its housing.

Since type DSG-21 can be adjusted for any one of several speeds, it has universal application and can be used at any group of intersections, regardless of the block lengths or speed of traffic desired.

In designing type DSG-21, it has been impossible to get total period adjustments in exact steps of 10 seconds, since it is not possible to cut a fraction of a tooth on a gear. The exact total period at each setting is given below:

1—40 Seconds
2—49.5 (Nominal 50) Seconds
3—60 Seconds
4—69.8 (Nominal 70) Seconds
5—80 Seconds

The gears for giving these various speeds are mounted within the timer housing; a plate is mounted directly in front of them, indicating which ones are to be placed in mesh to give any one of the above total periods.

•Denotes change in information.

CROUSE-HINDS

Automatic Timing Switches•

Type DA-21 Variable — **Types DSG-21 and DSG-2105 Gear Shift Synchronous**

For Isolated Intersections and Simultaneous or Alternate Traffic Control Systems

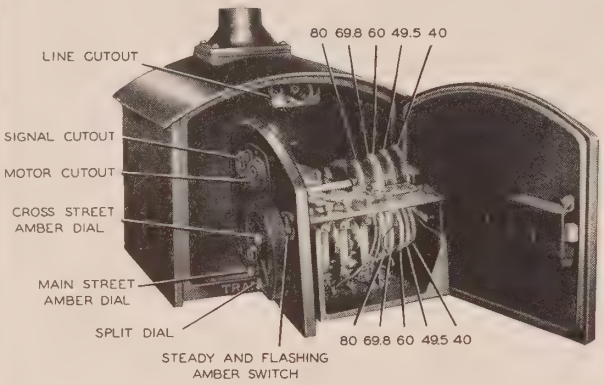


Fig. 3
Type DSG-21 Automatic Gear Shift Synchronous Timing Switch
Door Open showing Timer Swung Out

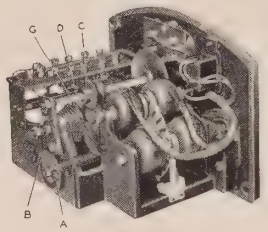


Fig. 4
Type DSG-2105 Automatic Gear Shift Synchronous Timing Switch
View showing Gear-Shifting Mechanism

Type DSG-2105 Gear Shift Synchronous Timing Switch—Adjustable Total Period

Type DSG-2105 is identical with type DSG-21 except that it has a different gear-shifting mechanism. With type DSG-2105 it is possible to obtain any desired total period between 35 and 120 seconds in exact steps of one second. The standard timer is equipped with five gears to give total periods of 40, 50, 60, 70, and 80 seconds, but it can be furnished with gears to give different total periods. All of the total period gears are assembled on the cam shaft and it is only necessary to shift an idler gear in mesh with the proper total period gear. The standard control is furnished with five total period gears, but when required, five additional total period gears may be placed on the cam shaft.

The gear-shifting mechanism is simple to operate and the change from one total period to the other may be accomplished in a few seconds' time. In Fig. 4 above, the type DSG-2105 timing switch is set for an 80-second total period. By loosening screw "A" and rotating dial "B" in a clockwise direction, the driving gear "G" is unmeshed. By loosening set screw "C," the driving gear assembly is moved along the square shaft "D" until the driving gear "G" is opposite the gear having the new desired total period. Set screw "C" is then locked in position. Dial "B" is then rotated in a counter-clockwise position until the driving gear "G" meshes with the proper gear on the main cam shaft, after which set screw "A" is tightened. This locks the entire assembly in place.

Like other Crouse-Hinds automatic timing switches for isolated intersections listed in this section, type DSG-2105 is a completely self-contained unit having a main line, signal and motor fuse cutouts, and switch in signal circuit. The same wide range of adjustment is obtainable with this switch as with all the others.

Completely Self-Contained Unit

Types DA-21, DSG-21, and DSG-2105 timing switches are complete and self-contained, including not only the timing apparatus, but also a main line switch and fuse cutouts, an auxiliary switch for obtaining both flashing and steady amber, and a connection block. With these complete timing switches, it is unnecessary to install any additional apparatus for the control of the signal lights. The entire switch assembly is mounted on a face plate and may be withdrawn from the cabinet for inspection without disturbing any connections or interrupting the operation. When the timer is swung out of the cabinet, all parts are readily accessible.

Range and Adjustment

These timing switches provide for the following adjustments:

1—Control of the Main Street green from 35 to 75% of the total period;

2—Control of the North-South amber or change period from 0 to 20% of the total period, making it possible to eliminate the amber color entirely;

3—Control of the East-West amber or change period from 0 to 20% of the total period, making it possible to eliminate the amber color entirely.

All of these adjustments are made by dials on the face of the timer without the use of tools and can be made while the timer is in operation.

The two amber periods are taken from the time allowed for the cross street; thus, in computing the amount of time for the main and cross streets, this must be taken into consideration. If the timer is set for a total period of 60 seconds, the main street "GO" dial set at 60%, and both amber periods set for 5% of the total period, the actual timing will be:

36 Seconds for the Main Street "GO"
3 Seconds for the Amber or Change Period
18 Seconds for the Cross Street
3 Seconds for the Amber or Change Period

The arms providing these adjustments are locked in position. The change in all of the percentage adjustments is made gradually and not in fixed steps, thus giving extremely fine gradations of timing.

•Denotes change in information.

CROUSE-HINDS

Automatic Timing Switches•

Type DA-21 Variable — **Types DSG-21 and DSG-2105 Gear Shift Synchronous**

For Isolated Intersections and Simultaneous or Alternate Traffic Control Systems

Color Sequences

There is no standard color sequence used throughout the United States, and in order to make Crouse-Hinds timing switches universal in application, any of the following color sequences may be obtained merely by connecting the signals properly to the connection block. No additional apparatus is necessary, and no cam adjustments are required.

A—Amber Period Following Green Only
B—Amber Period Overlapping Green Only
C—All-Amber Period Following Both Preceding Colors
D—All-Amber Period Overlapping Both Preceding Colors

Color sequences A and B are particularly recommended for use with three-color signals. See section 612, pages 1 to 3.

When two-color signals are used, any of the standard color sequences generally used with these signals can be obtained.

Steady or Flashing Amber

On the face plate of the timing switch, there is an auxiliary switch which provides both steady and flashing amber, as desired. When this switch is in the normal vertical position marked "TC," the signal colors are displayed in their proper order. When thrown to the right, to the position marked "SA," regular signal operation is discontinued, and the amber lights are shown steadily in all directions. When thrown to the left, to the position marked "FA," the amber lights will flash intermittently in all directions.

Contacts

The contacts are made of non-corrosive metal and have a capacity of 10 amperes at 115 volts. All contacts are made and broken quickly, and the contacts are self-wiping. This arrangement assures long life to the contacts. In the regular traffic cycle, the amber color occurs twice as often as the other signal colors, and in order to make the life of the amber contacts equal to those of the other contacts, a double set of amber contacts is employed. Both the fixed and movable contacts are readily accessible for inspection and renewal.

Motor and Bearings

These timing switches are driven by induction-disc or synchronous-disc motors, directly connected through spur reduction gearing to the control mechanism. Uniform rotary motion is employed throughout, thus reducing wear to a minimum and insuring long life. All bearings and shafts are designed to reduce the frictional load to a minimum. Lubrication is necessary only at infrequent intervals. It is recommended that the timers be inspected and oiled periodically, using a good grade of watch oil. The Crouse-Hinds Company will furnish a satisfactory lubricant in small cans.

Manual Switch

If desired, Crouse-Hinds standard type TSS-4 manual switch may be added to the straight automatic control, thus giving a combined automatic and manual control, which is mounted in a size 18 cast aluminum, weatherproof cabinet. When the signals are connected to the connection blocks to give any one of the color sequences mentioned above, the manual switch automatically gives this same color sequence and no other. There are no positions on the manual switch through which an operator must move the handle quickly to avoid displaying colors not wanted. With a manual switch of this kind, displaying the signal colors in exactly the same order as the automatic switch, there is no confusion to traffic. Any of the color sequences may be obtained with the manual switch as well as with the automatic.

The manual switch is mounted on the door of the cabinet and a removable handle is provided, the handle being placed inside of the cabinet when not in use. The manual switch is completely enclosed in a sheet metal housing, making it impossible for an operator to touch any live parts accidentally.

There is an indicating dial for the handle of the manual control switch, indicating its various positions of operation. The handle may be removed from the switch only when the switch is in the automatic position.

The auxiliary TSS-4 manual switch is entirely independent of the automatic control switches and may be used to control signals at any time, in case of failure of the automatic switch.

Mountings

For mounting indoors, these control switches are mounted in a size 8 cast aluminum cabinet with a connection block directly on top of the cabinet. For mounting outdoors, they are mounted in a size 11 cast aluminum cabinet, and the combined automatic and manual switch is mounted in a size 18 cast aluminum cabinet. Sizes 11 and 18 cabinets are weatherproof and have a gasketed door provided with a lock. Inside of these cabinets are suitable connection blocks for all of the incoming and outgoing wires. The cabinets are wired complete.

Sizes 11 and 18 cabinets may be furnished for either wall, wood-pole, steel-pole, or pedestal mounting. Cabinets for wall and wood-pole mounting are furnished with straps for attaching to the pole or wall by means of lag screws. Cabinets for steel-pole mounting are regularly furnished with two adjustable pole bands which will fit any tubular steel pole with a diameter of 3 to 9 inches, inclusive. These bands can also be fastened around concrete or irregular shaped poles. It is, therefore, unnecessary to specify pole sizes. See section 613 for cabinet dimensions.

•Denotes change in information.

CROUSE-HINDS

Type DA-21 Automatic Variable Timing Switches•

Variable Speed—40 to 120 Seconds Total Period‡

10-Ampere, 115-Volt, 60-Cycle A. C.★

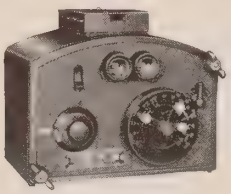


Fig. 1
Size 8 Cabinet
Indoor Mounting

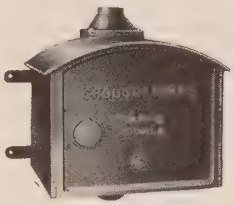


Fig. 2
Size 11 Cabinet
Wood-Pole Mounting

Fig. 3
Size 18 Cabinet
Steel-Pole Mounting

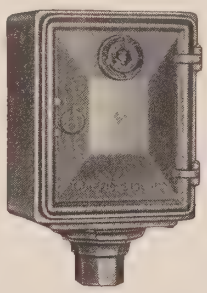


Fig. 4
Size 18 Cabinet
With Pedestal Adapter

Type DA-21 Automatic Operation Only

In Size 8 Cast Aluminum Cabinet—Indoor Installation Only

Description	Without Flasher		With Flasher	
	Cat. No.	List, each	Cat. No.	List, each
With Fusible Main Switch	45965	$145.00	45967	$151.00

Type DA-21 Automatic Operation Only

In Size 11 Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

Description		Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
With Fusible Main Switch	Without Flasher	45971	$160.00	45972	$160.00	45973	$168.00
	With Flasher	45977	$166.00	45978	$166.00	45979	$174.00

Type DA-21 Combined Automatic and Manual Operation

In Size 18 Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

Description		Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
With Fusible Main Switch	Without Flasher	45989	$198.00	45990	$198.00	45991	$206.00
	With Flasher	45995	$204.00	45996	$204.00	45997	$212.00

Type DA-21 control is driven by an induction-disc motor and the total period may be varied gradually from 40 to 120 seconds. It is intended for use at isolated intersections.

Extra Equipment

Description	List, each
Radio Interference Suppressor for Flashing Contacts	$ 8.00
Base Light or Sign Switch, Manually Operated	3.00
Time Switch for Shut-down	34.00
Time Switch and Relay for Flashing Amber	46.00

‡If specified on the order, these timing switches can be furnished for other total periods. **Dimensions,** section 613.
★For 25, 40, or 50 cycles, add $10.00 to the list prices.
★★Prices include 3-inch pedestal adapter or fitter, but not the pedestal. Crouse-Hinds pedestal, Cat. No. 45870, 34 inches high, is listed in section 609, page 7.
§Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Special mounting attachments for steel-pole mounting are listed in section 608, page 5. •Denotes revised listing.

CROUSE-HINDS

Type DSG-21 Automatic Synchronous Timing Switches•

With Five Gear Changes—Adjustable Total Period—40 to 80 Seconds

10-Ampere, 115-Volt, 60-Cycle A. C.★

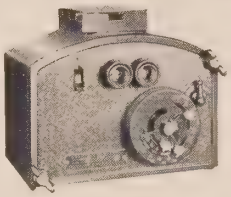


Fig. 1
Size 8 Cabinet
Indoor Mounting

Fig. 2
Size 11 Cabinet
Wood-Pole Mounting

Fig. 3
Size 18 Cabinet
Steel-Pole Mounting

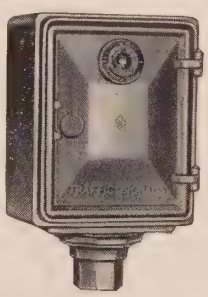


Fig. 4
Size 18 Cabinet
With Pedestal Adapter

Type DSG-21 Automatic Operation Only

In Size 8 Cast Aluminum Cabinet—Indoor Installation Only

Description	Without Flasher		With Flasher	
	Cat. No.	List, each	Cat. No.	List, each
With Signal and Motor Fuse Cutouts and Switch in Signal Circuit	46049	$145.00	46051	$151.00

Type DSG-21 Automatic Operation Only

In Size 11 Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

Description		Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
With Main Line, Signal and Motor Fuse Cutouts, and Switch in Signal Circuit	Without Flasher	46055	$160.00	46056	$160.00	46057	$168.00
	With Flasher	46061	$166.00	46062	$166.00	46063	$174.00

Type DSG-21 Combined Automatic and Manual Operation

In Size 18 Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

Description		Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
With Main Line, Signal and Motor Fuse Cutouts, and Switch in Signal Circuit	Without Flasher	46073	$198.00	46074	$198.00	46075	$206.00
	With Flasher	46079	$204.00	46080	$204.00	46081	$212.00

Type DSG-21 control is synchronous-disc motor driven and is equipped with a gear-shifting mechanism and five total period gears to give total periods of 40, 49.5, 60, 69.8, and 80 seconds. These are the only gears available with type DSG-21 and the control is definitely limited to five gear changes.

Extra Equipment

Description	List, each
Radio Interference Suppressor for Flashing Contacts	$ 8.00
Base Light or Sign Switch, Manually Operated	3.00
Time Switch for Shut-down	34.00
Time Switch and Relay for Flashing Amber	46.00

★For 25, 40, or 50 cycles, add $10.00 to the list prices. **Dimensions,** section 613.

★★Prices include 3-inch pedestal adapter or fitter, but not the pedestal. Crouse-Hinds pedestal, Cat. No. 45870, 34 inches high, is listed in section 609, page 7.

§Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Special mounting attachments for steel-pole mounting are listed in section 608, page 5.

•Denotes revised listing.

CROUSE-HINDS

Type DSG-2105 Automatic Synchronous Timing Switches•

With Five Gear Changes—Adjustable Total Period—40, 50, 60, 70, and 80 Seconds

10-Ampere, 115-Volt, 60-Cycle A. C.★

Fig. 5
Size 8 Cabinet
Indoor Mounting

Type DSG-2105 Automatic Operation Only

In Size 8 Cast Aluminum Cabinet—Indoor Installation Only

Description	Without Flasher		With Flasher	
	Cat. No.	List, each	Cat. No.	List, each
With Signal and Motor Fuse Cutouts and Switch in Signal Circuit	46172	$145.00	46174	$151.00

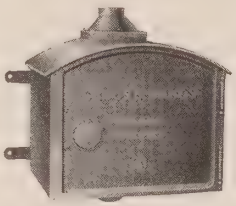


Fig. 6
Size 11 Cabinet
Wood-Pole Mounting

Type DSG-2105 Automatic Operation Only

In Size 11 Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

Description		Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
With Main Line, Signal and Motor Fuse Cutouts, and Switch in Signal Circuit	Without Flasher	46178	$160.00	46179	$160.00	46180	$168.00
	With Flasher	46184	$166.00	46185	$166.00	46186	$174.00

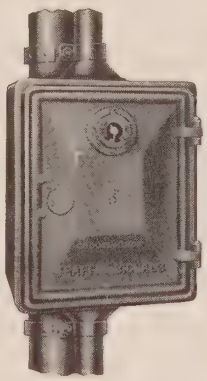


Fig. 7
Size 18 Cabinet
Steel-Pole Mounting

Type DSG-2105 Combined Automatic and Manual Operation

In Size 18 Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

Description		Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
With Main Line, Signal and Motor Fuse Cutouts, and Switch in Signal Circuit	Without Flasher	46196	$198.00	46197	$198.00	46198	$206.00
	With Flasher	46202	$204.00	46203	$204.00	46204	$212.00

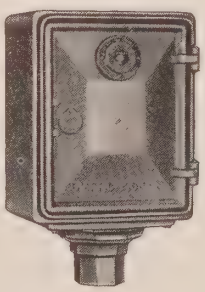


Fig. 8
Size 18 Cabinet
With Pedestal Adapter

The standard type DSG-2105 control listed above is equipped with five gear changes only to give total periods of 40, 50, 60, 70, and 80 seconds. The control may be supplied at the prices given above with any five gear changes in multiples of 5 seconds from 35 seconds to 120 seconds. If specified on the order, this control may be equipped with ten gear changes at the increased price per gear shown below.

Extra Equipment

Description	List, each
Extra Total Period Gears in Multiples of 5 Seconds	$ 1.00
Extra Total Period Gears not Multiples of 5 Seconds	3.00
Radio Interference Suppressor for Flashing Contacts	8.00
Base Light or Sign Switch, Manually Operated	3.00
Time Switch for Shut-down	34.00
Time Switch and Relay for Flashing Amber	46.00

★For 25, 40, or 50 cycles, add $10.00 to the list prices. **Dimensions,** section 613. •Denotes revised listing.
★★Prices include 3-inch pedestal adapter or fitter, but not the pedestal. Crouse-Hinds pedestal, Cat. No. 45870, 34 inches high, is listed in section 609, page 7. §Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Special mounting attachments for steel-pole mounting are listed in section 608, page 5.

CROUSE-HINDS

Cascade Relay Boxes

For Use with Crouse-Hinds Control Equipment

15-Ampere, 115-Volt, 60-Cycle A. C.‡

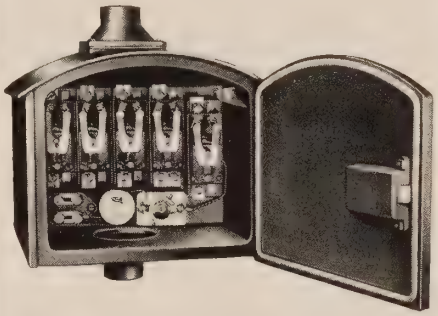


Fig. 1
Cascade Relay Box
With Five Jack-Mounted Relays

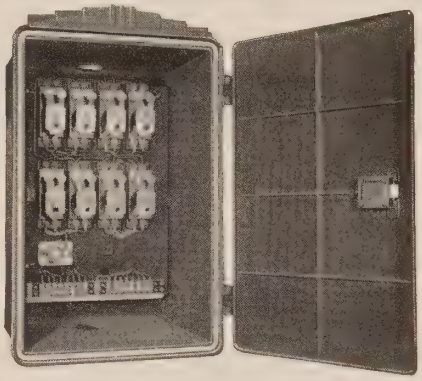


Fig. 2●
Cascade Relay Box
With Eight Jack-Mounted Relays

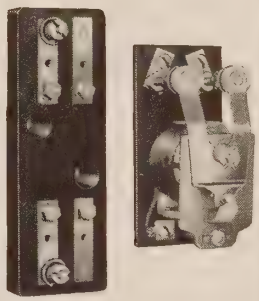


Fig. 3●
Single-Pole, Single-Throw
Jack-Mounted Relay
With Subbase

Many cities use a simultaneous or alternate system of traffic control, in which the signal indications are changed from green to red at the same time by means of a simple, inexpensive automatic switch—type DA-21, listed and described on page 4 of this section. When these systems reach or go beyond four or five intersections, it is necessary to install cascade relay boxes at one or more points in the system. The use of these relay boxes serves a double purpose, in that it reduces the load on the timer contacts, and permits the use of much smaller copper wires between intersections.

All Crouse-Hinds automatic timing switches have a rating of 10 amperes at 115 volts, and will carry the load of four four-way signals, or sixteen one-way signals. When more signals are connected directly to controls, the useful life of the contacts is shortened. Cascade relay boxes installed at convenient locations will carry the excess load.

It is, furthermore, uneconomical to transmit power to a large signal system from a central point, since large, expensive cables would be required to keep the line loss within reasonable limits. With Crouse-Hinds cascade relay boxes, power may be picked up at convenient points and transmitted short distances to the signals.

Crouse-Hinds cascade relay boxes have a rating of 15 amperes at 115 volts and will, therefore, supply current for six or seven four-way signals or their equivalent. All relay contacts are made of fine silver and are $\frac{5}{8}$-inch in diameter and $\frac{1}{8}$-inch thick. The relays are jack-mounted and may, therefore, be quickly removed for inspection or replacement without disturbing the wiring. Each relay station is equipped with a switch and fuse for the incoming power circuit and large substantial terminals for the incoming and outgoing wires.

Cascade relay stations having three to five relays are mounted in size 11 cabinets, and stations of six to eight relays are mounted in size 22 cabinets. Cabinets are made of cast aluminum. They are gasketed, thus making them dust-tight and weatherproof, and are provided with a lock.

Both sizes 11 and 22 relay cabinets are provided with $1\frac{1}{2}$-inch hub plates on top and bottom, for connection to a rigid conduit system. See section 608, page 13 for other hub plates.

Description	Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
	Cat. No.	List, each●	Cat. No.	List, each●	Cat. No.	List, each●
3 Relays in Size 11 Cabinet	45916	$ 95.00	45922	$ 95.00	45928	$103.00
4 Relays in Size 11 Cabinet	45917	110.00	45923	110.00	45929	118.00
5 Relays in Size 11 Cabinet	45918	125.00	45924	125.00	45930	133.00
6 Relays in Size 22 Cabinet	45919	140.00	45925	140.00	45931	148.00
7 Relays in Size 22 Cabinet	45920	155.00	45926	155.00	45932	163.00
8 Relays in Size 22 Cabinet	45921	170.00	45927	170.00	45933	178.00
Single-Pole, Single-Throw Jack-Mounted Relay Only, less Sub-Base			KL471	$10.00		
Subbase for Relay KL471			KL472	5.00		

If relay positions are required but not the relay itself, deduct $10.00 from the list prices for each relay omitted.

‡These relay boxes may be equipped with mercury break relays having a capacity of 30 amperes at 120 volts A. C., at an increase in the list price of $5.00 per relay. The mercury relay is interchangeable with the standard silver contact relay. For relay stations with other capacities, voltages and frequencies, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

★★Prices include 3-inch pedestal adapter or fitter, but not the pedestal. Crouse-Hinds pedestal, Cat. No. 45870, 34 inches high, is listed in section 609, page 7.

§Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Special mounting attachments are listed in section 608, page 5.

Dimensions, section 613.

●Denotes change in illustrations and prices.

Types TSS-4 and TSS-5 Manual Control Switches

Two-Street, Four-Interval and Three-Street, Six-Interval

10-Ampere, 115-Volt A. C. or D. C.

In Size 11 Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

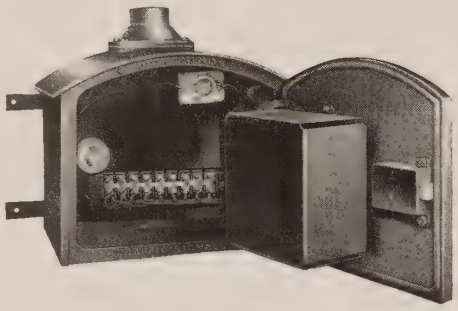


Fig. 4
Type TSS-4 Manual Control Switch
Two-Street, Four-Interval
Cover in Place

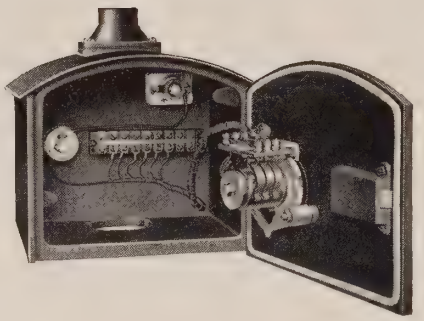


Fig. 5
Type TSS-5 Manual Control Switch
Three-Street, Six-Interval
Cover Removed

Often, at certain intersections, it is desirable to control the signals by means of manual instead of automatic control switches. For such conditions, Crouse-Hinds lists types TSS-4 and TSS-5 manual control switches. These manual switches are mounted in size 11 cast aluminum, weatherproof cabinets. They are large and substantial and will last for a long time, even though they are operated continually, day after day.

The contacts are extra heavy, which means long life. Pressure between the moving and the stationary contacts is positive, hence, there is no flickering of the lights.

These switches are mounted on the door of the cabinet and are readily accessible for inspection. They are operated by a removable handle which, when not in use, is placed within the cabinet. The switch positions are indicated by a suitable dial, and the contacts drop into their natural positions. It is, therefore, impossible to over-run any contact position accidentally.

Type TSS-4 manual switch will give any desired color sequence merely by making the proper connections. Type TSS-5, being a three-street, six-interval control switch, is listed below for the four popular color sequences. It is, however, so flexible that any other color sequence may be obtained on special order.

Listings are given below for steel-pole, wood-pole, and pedestal mountings.

Complete with Main Line Switch, Cutout, and Terminal Block. Mounted in Size 11 Cabinet with Lock

Type	Color Sequence	Steel-Pole Mounting§		Wood-Pole Mounting§		Pedestal Mounting★★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
TSS-4	Any	45913	$70.00	45914	$70.00	45915	$78.00
TSS-5	Amber Overlapping Green Only	45953	$86.00	45957	$86.00	45961	$94.00
	Amber Following Green Only	45954	86.00	45958	86.00	45962	94.00
	Amber Overlapping Both Preceding Colors	45955	86.00	45959	86.00	45963	94.00
	Amber Following Both Preceding Colors	45956	86.00	45960	86.00	45964	94.00

★★Prices include 3-inch pedestal adapter or fitter, but not the pedestal. Crouse-Hinds pedestal, Cat. No. 45870, 34 inches high, is listed in section 609, page 7.

§Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Special mounting attachments for steel-pole mounting are listed in section 608, page 5.

Dimensions, section 613.

CROUSE-HINDS

Type K Traffic Signal Controllers

For Non-Interconnected Operation

Type KS Synchronous — 6 Color Circuits — Unit Construction—Jack Mounted — **Type KA Variable** — 4 to 16 Intervals

Fig. 1
Type KS Synchronous Controller
Mounted in Size 16 Cabinet

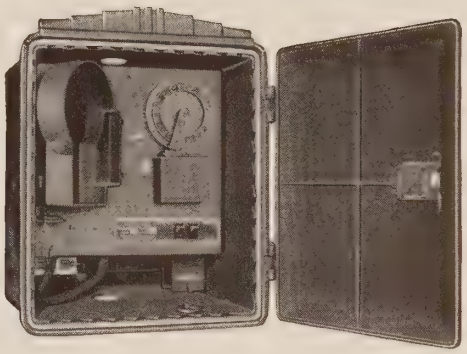


Fig. 2
Type KA Variable Speed Controller
Mounted in Size 16 Cabinet

The type K line of traffic signal controllers is new and modern, designed by the Crouse-Hinds Company as a result of its long experience in the field of traffic control. These controllers are simple, reliable, and sturdy; designed according to the sound engineering practices followed by the Crouse-Hinds Company since the inception of traffic control.

The type K line of controllers has been designed primarily to replace the type D line, but has much greater flexibility. The type K controllers are similar in many respects to the type G controllers, listed in section 605, except that the type K controller is limited to six signal circuits and is designed for non-interconnected operation only. The same successful dial and the cam-shaft mechanism is used, and many of the parts of the type K controllers are interchangeable with the similar parts of the type G controllers.

Types Available—KS Synchronous and KA Variable

There are two separate and distinct models of the type K controller; namely, type KS synchronous controller and type KA variable controller, each carefully designed and engineered for its particular field of application. The type KS controller may be used on the same circuit with Crouse-Hinds types DSA-21, DSG-21, DSG-2105, GS-2, and GS-3 controllers; and the type KA controller may be used on the same circuits with the types DA-21 and GA-2 controllers.

The type KS controller is driven by a high-torque synchronous motor of the disc type, requiring a small power input. The synchronous motor is a time-keeping device and the controller will keep in step with the frequency of the supply circuit, making it possible to control signals at adjacent corners and keep them in step without any interconnecting wires other than the power company's network. The type KS controller is made, therefore, to use without any interconnecting cable to give a simultaneous, an alternate simultaneous, or a limited-progressive system of traffic control.

The type KA controller is driven by a variable-speed, induction-disc motor and, by simply turning a dial on the face-plate, the time cycle may be varied throughout a wide range. The standard controller, listed in this section, has a range of 40 to 120 seconds, but it can be furnished without extra charge for ranges of 30 to 90 seconds or 20 to 60 seconds.

CROUSE-HINDS

Type K Traffic Signal Controllers

For Non-Interconnected Operation

Type KS Synchronous — 6 Color Circuits

Unit Construction—Jack Mounted

Type KA Variable — 4 to 16 Intervals

Construction

Type K controllers are built of separate units, each complete in itself. A complete controller consists of a face-plate and dial assembly, a timing-unit, a cam-unit, and a panel assembly. The various units are assembled on the face-plate and wired. The timing-unit and the cam-unit are completely assembled and wired so that each may be removed from the face-plate without disturbing any other piece of equipment. The complete assembly is protected by a dust cover and connected to the field terminal block, mounted on the rear wall of the cabinet, by means of a multi-circuit plug and receptacle. This assembly may be removed from the cabinet without the use of tools and without breaking any of the electrical connections.

Electrical Interlock

The cam-unit and the timing-unit are electrically interlocked and will always remain in step.

If for any reason, such as shut-down or manual operation, the cam-unit gets out of step with the timing-unit, the cam-unit will continue to rotate until it comes around to the main street green, where it will dwell in this position until it gets in step with the timing-unit.

When the timer is shut down for the night by means of the time switch or by manual operation, it may be shut down at any time because, although signal colors go out immediately following the operation of the shut-down switch, the cam-shaft continues to rotate until it comes around to main street green interval. Therefore, in starting in the morning, the timer will always start on the main street green. The same thing is true if flashing amber is the off-duty indication.

During the display of emergency all-red for the passage of fire apparatus, the signal colors are changed by means of the relays. During this interval the cam-unit and timing-unit remain in their proper relationship: thus, when normal operation is restored they will be in step.

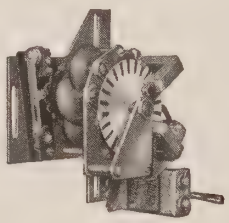


Fig. 3
Timing-Unit
Type KS Synchronous Controller

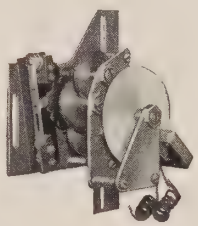


Fig. 4
Timing-Unit
Type KA Variable Controller

Timing-Unit

The timing-unit motors of both controllers are of the low-speed, disc type, revolving at approximately 300 R.P.M. and all shafts are equipped with ball bearings. The magnetic circuit of the motors is of laminated construction, and the result is a highly efficient motor, having a very high torque with a low wattage input. This type of motor has proven successful in traffic signal controller operation for more than 20 years.

The synchronous timing-unit and the variable timing-unit are interchangeable, the only difference between the two is that the timing-unit of the KS synchronous controller has two magnetic circuits instead of one and the motor discs are different. All parts except the discs are interchangeable.

Gear Shift

All type KS controllers are equipped with a hand-operated gear shift to provide for changes in the time-cycle. When shipped from the factory, all controllers are equipped with five gears to give time-cycles of 40, 50, 60, 70, and 80 seconds.

Gears to give time-cycles of 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 100, 110, and 120 seconds are carried in stock and any five may be substituted for the five standard gears without extra charge.

Special gears in steps of one second will be furnished at an increased price if specified on the order. See page 14 of this section.

CROUSE-HINDS

Type K Traffic Signal Controllers

For Non-Interconnected Operation

Type KS Synchronous — **6 Color Circuits** — **Unit Construction—Jack Mounted** — **Type KA Variable** — **4 to 16 Intervals**

Hand Reset

All type KS controllers are equipped with an offset arm and a hand-operated reset switch, with which it is possible to resynchronize the controller and restore the offset or beginning of the green to its proper place for progressive traffic flow.

Time-Cycle Change—Type KA Controller

Type KA controller is driven by an induction-disc motor, the speed of which is governed by the position of the shading pole. On the face-plate of the type KA controller, there is an adjusting screw for changing the position of the shading pole and a scale graduated in seconds from 40 to 120 with an indicator for setting the controller at the proper time-cycle.

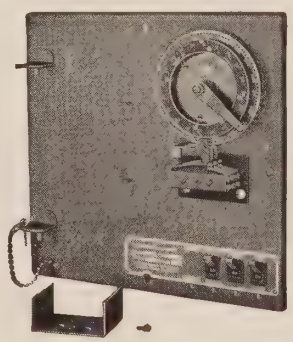


Fig. 1
Face-Plate and Dials
Type KS Synchronous Controller

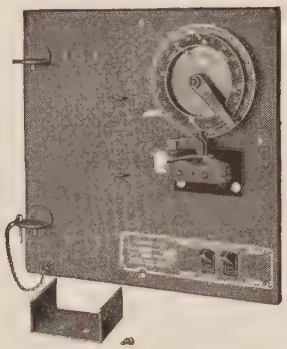


Fig. 2
Face-Plate and Dials
Type KA Variable Controller

Fig. 3
Dial and Dial Contacts

Face-Plate and Dial Assembly

Figs. 1 to 3 above show the face-plates for the three controllers. The dials are identical on all three.

The dial consists of two parts. The outer one, marked "Timing-Split Dial," is used only to determine the division of the time cycle into the number of intervals. The rear or larger dial, marked "Offset Dial," is used for setting the offset, or beginning of the green interval, for a progressive traffic movement. This dial is used only with type KS controllers.

There are 100 divisions in the offset dial and 100 divisions in the timing-split dial.

The interval percentages are determined by the location of the timing-split keys placed in the holes of the timing-split dial.

Under the dials are the dial contacts, which are used for the interval-indexing, interlock, and resynchronizing circuits. These contacts are large and heavy and, since the current is small, will last for a long time.

A hinged cover (not shown in the illustration) is placed over the dial and dial contacts, completely enclosing them. This cover is locked with a special screw, opened only with a key, to prevent access by unauthorized persons. If specified on the order, this special screw will be replaced by an ordinary round head screw.

CROUSE-HINDS

Type K Traffic Signal Controllers

For Non-Interconnected Operation

Type KS Synchronous — **Type KA Variable**

6 Color Circuits — Unit Construction—Jack Mounted — 4 to 16 Intervals

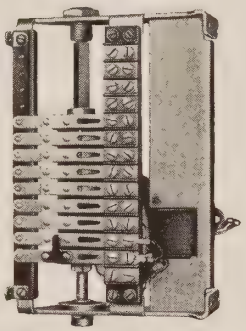


Fig. 4
Cam-Unit—Contact Side

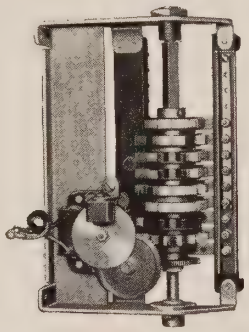


Fig. 5
Cam-Unit—Motor Side

Cam-Unit—Color Sequence Flexibility

Figs. 4 and 5 show the cam-unit, clearly illustrating its design, simplicity, and accessibility. The cam-unit motor receives electrical impulses from the dial contacts and drives the cam-shaft forward one position at a time. This is a powerful, ball-bearing type motor equipped with an electro-dynamic brake to prevent coasting. All cam-units provide a maximum of sixteen intervals, but any lesser number of intervals may be used merely by resetting the cam-lobes. This can be done in the field without the use of tools.

The cam-unit has provision for six circuits in addition to the two control circuits. The bottom cam controls the interval indexing circuit; the next cam controls the circuit which electrically interlocks the cam-unit with the dial contacts; and above these are placed the color circuit cams.

A cam-unit originally purchased for six-circuit, four-interval operation may be changed in the field to give six-circuit, five or six-interval operation by resetting the removable lobes in the cams. All cams are identical and may be used for any color sequence. It is merely necessary to change the positions of the lobes.

Signal Shut-Down

Every type K controller is provided with a signal shut-down switch so that the lights may be turned out. After this switch has been operated, and the signal lights are off, the cam-shaft of the controller continues to rotate until it takes up the main street green position so that when the signals are turned on in the morning the first indication is for main street green.

Flashing Amber or Amber and Red

For periods of light traffic or late at night, the regular "stop-and-go" operation may be discontinued and the signals turned to flashing amber in all directions, or to flashing amber on the main street and flashing red on the cross street. Type K controller provides for both flashing operations by a simple interchange of connections.

Flashing operation may be accomplished locally by means of a manually operated switch or by a time switch.

Emergency All-Red

Some cities stop all vehicular traffic for the passage of fire apparatus or other emergency vehicles. Any type K controller may be equipped with an emergency all-red feature to be operated either locally by a hand-operated switch or from a remote point by means of a remote control relay.

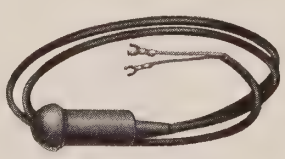


Fig. 6
Manual Switch and Cord

Manual Operation

At some isolated intersections it is at times necessary to discontinue automatic control and substitute manual control by a traffic officer. To provide this feature, type K controllers may be equipped with a manual switch. This is a single grip switch, mounted within a rubber handle, having an extension cord. All type K controllers have terminals to which this manual switch may be attached. A hand-operated switch is provided for throwing from automatic to manual operation.

Type K Traffic Signal Controllers

For Non-Interconnected Operation

Type KS Synchronous — 6 Color Circuits

Unit Construction—Jack Mounted

Type KA Variable — 4 to 16 Intervals

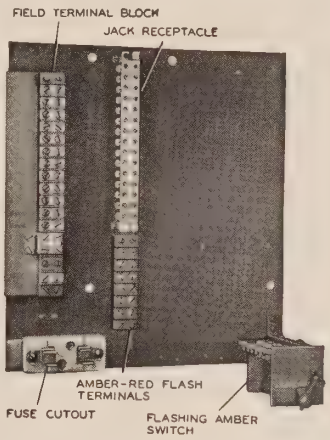


Fig. 1
Panel with Hand-Operated Flashing Switch

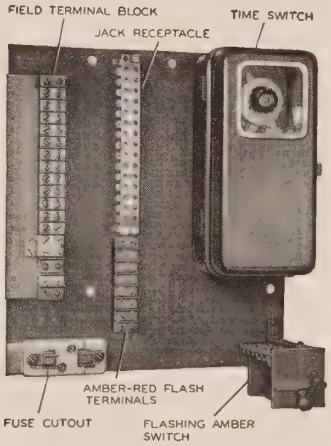


Fig. 2
Panel with Time Switch For Signal Shut-down

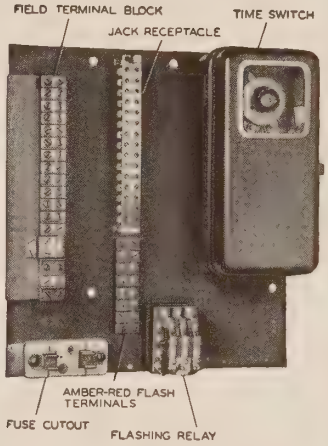


Fig. 3
Panel with Time Switch and Relay for Flashing

Rear Panels

The rear panels of types KS and KA controllers are identical, and on all of them are mounted the following:

1. Terminal block with marking strip for all field connections;
2. N. E. C. cartridge fuse cutout for hot side of power supply;
3. Amber-red flash terminals for obtaining flashing amber or flashing red on the cross street;
4. Jack receptacle for completely disconnecting timer;
5. Flashing amber switch (local flashing only).

In addition to the above standard equipment, there is room on the panel for special equipment as may be ordered. Figs. 1, 2, and 3 above show typical panels for either the KS or the KA controller.

Wiring

All controllers, when shipped from the factory, are completely wired. This wiring extends from the timer proper through the jack connection to the rear panel for field connection. It is only necessary to connect the power supply and the signal leads to the rear panel. There are sufficient binding screws on the field terminal block for all common wires.

Accessibility for Inspection and Maintenance

Type K controller is very simple to operate and is easy to maintain. When the timer is swung out of the cabinet and the dust cover removed, all parts are accessible and in full view.

Stationary contacts and movable contacts are arranged in a single row and may be inspected or replaced in a very few seconds. The entire cam-shaft assembly may be quickly removed without disturbing any of the wiring or any of the contacts. Moreover, simply by breaking the jack connection, the complete timer may be removed from the cabinet. All field wiring is attached to the terminal board in the back. Separate substantial terminal strips with large binding screws are provided for all field connections.

The cabinet is large and roomy with ample space for working and for slack cable.

CROUSE-HINDS

Type K Traffic Signal Controllers

For Non-Interconnected Operation

Type KS Synchronous — 6 Color Circuits

Unit Construction—Jack Mounted

Type KA Variable — 4 to 16 Intervals

Standard Equipment Furnished with Type K Controllers

Description	Type KS	Type KA
Hand-Operated Gear Shift with Five Gears	Yes	No
Local Time-Cycle Control, 40–120 Seconds	No	Yes
Hand-Operated Local Signal Shut-down Switch	Yes	Yes
Hand-Operated Reset Switch	Yes	No
Automatic to Manual Transfer Switch	Yes	Yes
Hand-Operated Flashing Switch (flasher not included)	Yes	Yes
Identified Terminal Board for Field Connections	Yes	Yes
Fuse Cutout for Power Supply	Yes	Yes
Amber-Red Flash Terminals	Yes	Yes

Extra Equipment for Type K Controllers

Description	List, each
Flashing Mechanism	$ 6.00
Radio Interference Suppressor for Flashing Contacts	8.00
Manual Switch and Cord	7.00
Standard Time-Cycle Gears, for type KS controllers—30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, and 120 seconds.	
Any five furnished with controller	No Extra
For each standard gear over five	1.00
Special Time-Cycle Gears, time-cycle not divisible by five seconds.	
When furnished in place of standard gear	2.00
When purchased separately	3.00
Lamp Receptacle and Convenience Outlet, mounted inside of cabinet	5.00
Extra Hand-Operated Switches, for special circuits such as bell, base light, signs, etc., operated from inside of cabinet	3.00
Extra Hand-Operated Switches, Externally Operated	6.00
Each Time Switch, Space and Wiring (synchronous without reserve spring)	34.00†
Each Time Switch, Space and Wiring (synchronous with 10-hour reserve spring)	44.00†
•Relay for Flashing Amber by Means of Time Switch	12.00
Cabinet Space, Drilling and Wiring for Time Switch (time switch to be furnished by customer)	6.00

Instructions for Ordering

Since it is impossible to cover by catalog number all control variations, the following information is necessary before an order can be filled.

1. Color sequence. Furnish diagram.
2. Voltage and frequency, if other than 115 volts, 60 cycles.
3. Time-cycle gears, for type KS controller, if other than 40, 50, 60, 70, and 80 seconds.
4. Time-cycle range for type KA controllers: 40–120 seconds, 30–90 seconds, or 20–60 seconds. The standard range is 40 to 120 seconds, and will be furnished if order does not state another range.
5. Manual switch and cord.
6. Flashing mechanism.
   Amber all around.
   Amber main street, red cross street.
7. Radio interference filter.
8. Emergency all-red.
9. Time switch for signal shut-down.
10. Time switch for flashing. (Requires relay)†•
11. Cabinet data.
    Wood-pole straps, steel-pole bands, 4-inch pedestal adapter, or ground pedestal. State desired mounting.
    Top and bottom hub plates. State size and type. See section 608, page 13. If this information is not given in detail, cabinets will be furnished with YYP85S hub plate, tapped for 1½-inch conduit on both top and bottom of cabinet.
12. Special drilling. Furnish drawing.
13. Paint. If other than Crouse-Hinds standard green, a color sample must be furnished.
14. Extra equipment. See listing above.

†When time switch is used for flashing, a relay is required. Add $12.00 to list price.•
•Denotes addition.

CROUSE-HINDS

Type KS-1 Automatic Synchronous Controllers

With Gear Shift—Adjustable Time-Cycle—40, 50, 60, 70, and 80 Seconds‡

Complete Jack Mounted Controls in Size 16 Weatherproof Cabinets

6 Color Circuits, 16 Intervals — **10-Ampere, 115-Volt, 60-Cycle A. C.★**

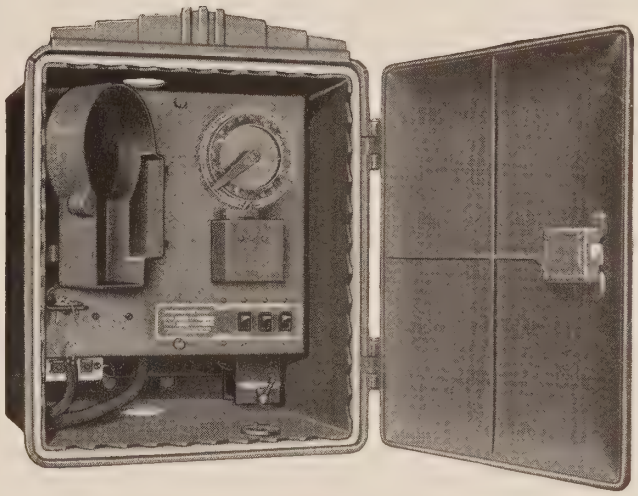


Fig. 1
Type KS-1 Synchronous Controller
Mounted in Size 16 Cabinet—Doors Open

Type KS-1 for Non-Interconnected Operation

With Hand Reset Switch

Type	Description	Cat. No.	List, each
KS-1	Without Flashing Mechanism	46452	$160.00
	With Flashing Mechanism	46453	166.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.

Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

‡These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.

Extra Equipment, section 603, page 14.

Instructions for Ordering, section 603, page 14.

Dimensions, section 613.

CROUSE-HINDS

Type KA-1 Automatic Variable Controllers

Variable Speed—40 to 120 Seconds Total Period‡

Complete Jack Mounted Controls in Size 16 Weatherproof Cabinets

6 Color Circuits, 16 Intervals — 10-Ampere, 115-Volt, 60-Cycle A. C.★

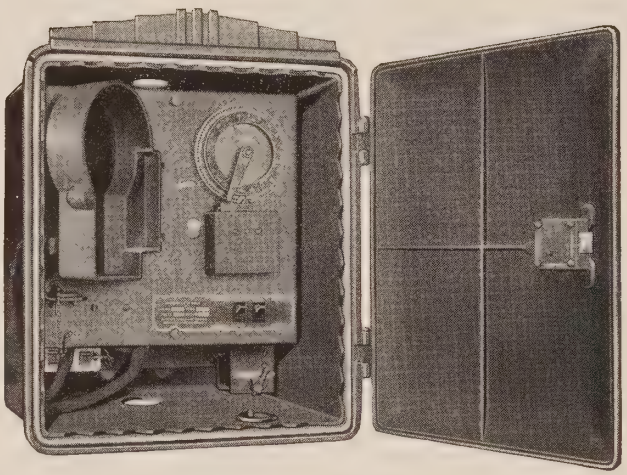


Fig. 2
Type KA-1 Variable Controller
Mounted in Size 16 Cabinet—Doors Open

Type KA-1 for Non-Interconnected Operation

Type	Description	Cat. No.	List, each
KA-1	Without Flashing Mechanism	46448	$160.00
	With Flashing Mechanism	46449	166.00

If cabinet is not desired, deduct $25.00 from list price of complete controller.

Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse, New York.

‡These controllers may be furnished with total period ranges of 30–90 seconds or 20–60 seconds, without extra charge.

Extra Equipment, section 603, page 14.
Instructions for Ordering, section 603, page 14.
Dimensions, section 613.

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

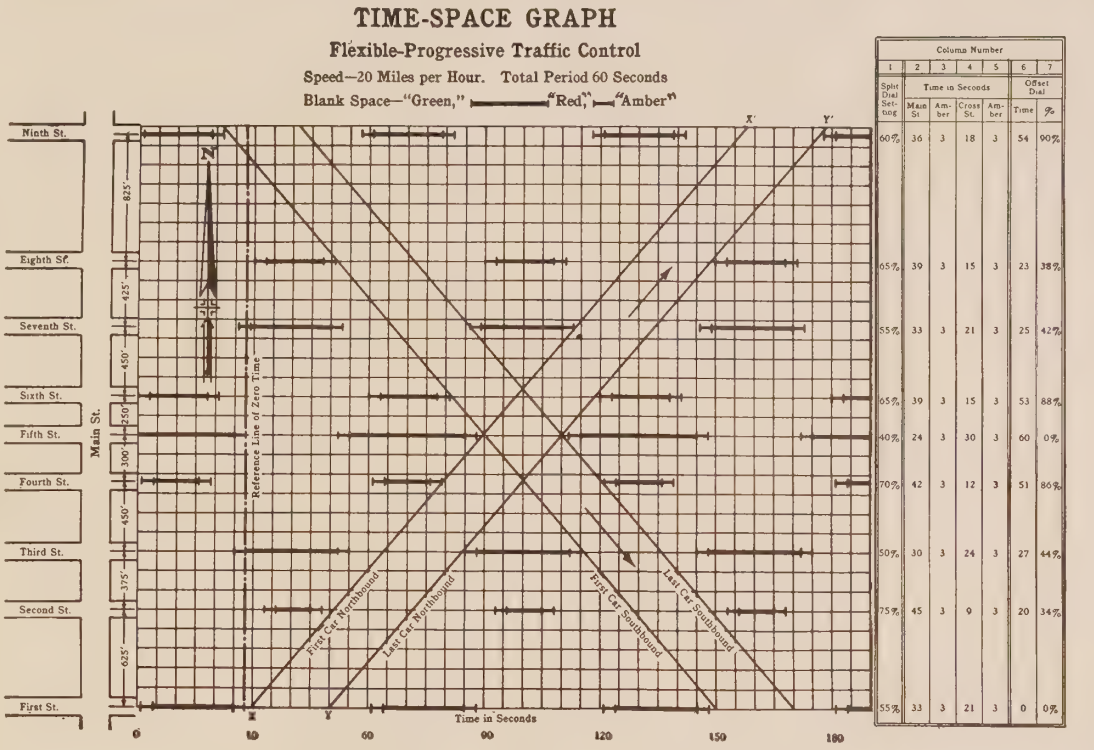


Fig. 1
Time-Space Graph for Flexible-Progressive Traffic Control

Time-Space Graph

The time-space graph shown in Fig. 1 illustrates the method of determining the settings of timers of a *Trafflex* control system for producing a flexible-progressive movement of traffic. On the left of the graph, the cross streets are shown to scale and on the bottom there is a scale of elapsed time. A traffic count, made at the various intersections, indicates the relative importance of the cross streets with respect to the main street and these various percentages are tabulated in Col. 1 to the right of the graph. On the street for which this graph was made, traffic was permitted to move at 20 miles per hour and the graph was plotted for this speed, as indicated by the slope of the line X-X′. For the distance traveled, somewhat over 3500 feet, a time-cycle of 60 seconds was found to be correct, and this time-cycle had to be split at each intersection according to the traffic count between the main street and the cross streets. This graph is typical of many cities in that the block lengths are very uneven and traffic on the cross streets varies greatly. After determining the time-cycle in seconds necessary to produce the desired speed of 20 miles per hour, the actual time allotted to each traffic movement at each intersection is tabulated in Cols. 2, 3, 4, and 5, headed "Time in Seconds." A study of these figures indicates the wide range of the *Trafflex* system. On Fifth Street traffic is heavier than it is on Main Street, while on Second Street there is very little traffic, as indicated by the time in seconds allotted for the various movements, where the time necessary for Main Street traffic is five times as great as for Second Street traffic.

A careful study of the street plan, the desired speed, and the relative amount of traffic on Main Street and the various cross streets, produced the above graph. For determining the setting of the "Offset Dial" to produce the flexible-progressive traffic movement, a line called "Reference Line of Zero Time" is drawn through the beginning of "Green" period at First Street, and the "Offset Dial" of this timer is set at zero.

At Second Street the "Green" period begins 20 seconds after zero time, at Fifth Street the "Green" period begins 60 seconds after zero time, etc. These offsets in seconds, shown in Col. 6, are translated into percentages in Col. 7.

The result is a smooth, uninterrupted flow of traffic throughout the entire length of the street, with signals showing successively "Green" in front of the driver, who makes no stops whatsoever.

The band of travel is 20 seconds wide, which is truly remarkable, since the maximum theoretical band of travel could only be 24 seconds, as indicated by the split in time required at Fifth Street for the heavier cross traffic.

This graph clearly shows that the extreme range and flexibility of the Crouse-Hinds *Trafflex* control system is necessary for the solution of the "traffic problem," as presented by the various municipalities. A control system without these features would be inadequate.

The graph is plotted for an average speed of 20 miles an hour, as indicated by the slope of line X-X′, but permits of speeds ranging from 17 and 24 miles per hour. If a car crosses First Street at the time X and leaves Ninth Street at time indicated by Y′, 148 seconds later, the resultant speed is 17 miles per hour. Similarly, if the car crosses First Street at time Y and leaves Ninth Street at time X′, 108 seconds later, the resultant speed is 24 miles per hour.

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Full Flexible-Progressive Control of Traffic

Traffic control is essentially a problem of keeping traffic moving continuously by arranging it in an orderly procession. In this way all unnecessary stops can be eliminated and considerable time saved in passing through the congested area.

Crouse-Hinds *Trafflex* control system provides for a full flexible-progressive movement of traffic, in which the operation of the signals at each intersection is determined by the traffic requirements of that particular intersection. It further provides a definite time relationship between adjacent controllers to permit a smooth, uninterrupted flow of traffic in all directions at varying speeds.

The speed at which traffic may move safely is determined by the physical conditions of the streets; such as block length, condition of paving, density of traffic, etc. With the Crouse-Hinds *Trafflex* control system, the speed of traffic may be varied to take care of these varying conditions.

Trafflex Control System

The *Trafflex* control system consists of a *Super-Trafflex* master controller located at control headquarters, at any convenient point within or near the control area, and a *Super-Trafflex* secondary at each of the controlled intersections.

The type GF *Super-Trafflex* controller is driven by the Crouse-Hinds standard *Trafflex* motor which has proven so efficient and reliable during past years. This motor employs both driving and bucking coils and provides for remote control of the time-cycle.

The *Super-Trafflex* master, which controls the speed at which traffic may flow, acts upon the *Super-Trafflex* secondaries, slowing them down or speeding them up as may be required; keeps the secondaries in their proper time relationship with respect to each other; and in general, completely supervises the operation of the secondaries at all times.

When the time-cycle regulator of the master is adjusted to give a different time-cycle, the secondaries respond instantly to any change in speed control. During the change from one time-cycle to another, the Crouse-Hinds *Super-Trafflex* secondaries do not get out of step. They respond instantly to the master and remain in step during the change and afterwards. No resynchronization by the master is required when the time-cycle is changed.

This system provides for remote control of the time-cycle, remote shut-down, remote flashing, remote emergency all-red, control of the offset from zero time, division of the time-cycle into the correct number of intervals, and automatic supervision of all secondaries.

Crouse-Hinds *Trafflex* system places in the hands of the traffic engineer means for controlling all phases of vehicular and pedestrian traffic.

The flexible-progressive control of traffic, as provided by the Crouse-Hinds *Trafflex* control system, is the only method of traffic control which is entirely satisfactory for large interlocked areas. The system is simple to install, easy to maintain, inexpensive to operate, requires little maintenance expense, and may be readily extended as traffic conditions warrant.

Type GFM *Super-Trafflex* Master

The Crouse-Hinds type GFM *Super-Trafflex* master controller shown below consists of a driving motor, dial and contacts for the two reset circuits, a time-cycle regulator, a time-cycle indicator, hand-operated switches for shut-down, flashing, and emergency all-red, and a fuse and terminal board which provides fusible terminals for the power supply, and for all wires in the interconnecting cable. The complete master controller is mounted in a cast aluminum weather-proof cabinet. The cabinet is suitable for either indoor or outdoor installation and may be mounted on a steel pole, a wood pole, a pedestal, or on the wall at control headquarters. The cabinet is provided with a lock to prevent unauthorized persons from tampering with the mechanism.

The controller is complete in itself. It is not necessary to purchase any other equipment for control headquarters.

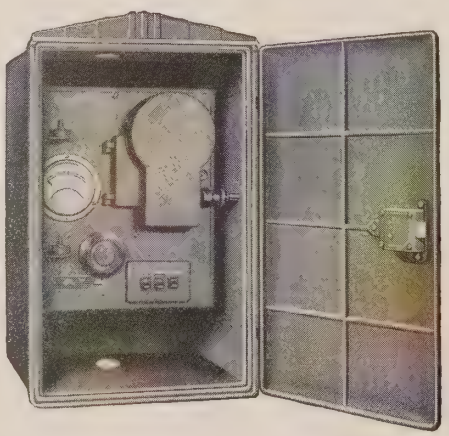


Fig . 2
Type GFM *Super-Trafflex* Master Controller
in Size 22 Cabinet

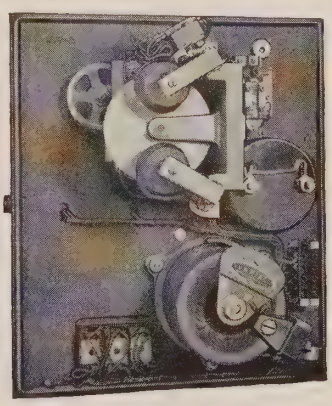


Fig. 3
Type GFM *Super-Trafflex* Master Controller

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Functions of the Master Controller

The Crouse-Hinds *Super-Trafflex* master controller is the heart of the full flexible-progressive traffic control system and performs the following functions:

(1) **Control of Time-Cycle.** By means of the time-cycle regulator the time-cycle may be varied from 40 seconds to 120 seconds,* and the time-cycle at which the system is operating is shown on the time-cycle indicator which reads directly in seconds.

(2) **Check of the Offset.** Once each time-cycle the master controller checks the offset, or beginning of the green interval, and maintains all secondaries in their proper time relationship.

(3) **Remote Shutdown Feature.** Each Crouse-Hinds *Super-Trafflex* master controller is provided with a hand-operated switch for starting and shutting down the entire system. If desired, the master controller may be equipped with a time-switch to perform this function.

(4) **Remote Flashing Feature.** Each Crouse-Hinds *Super-Trafflex* master controller is provided with a hand-operated switch for turning the signal system to flashing. If desired, the master may be equipped with a time-switch to perform this function.

Note: Each city determines its own off-duty operation, either shutdown or flashing, and a single time-switch will perform the desired function. Some cities turn signals to flashing operation from 12 midnight to 2 A.M., and then to complete shutdown from 2 A.M. until morning starting time. A special time-switch may be obtained to schedule this operation.

(5) **Remote Emergency Feature.** Each Crouse-Hinds *Super-Trafflex* master controller is provided with a hand-operated switch for displaying the emergency all-red signal indication. The circuit controlling this feature is generally extended to fire alarm headquarters and a duplicate switch placed on the operator's desk. The duration of the emergency signal is usually timed by a type AE-2 automatic-reset, variable-timing relay listed in Section 602.

Type GF *Super-Trafflex* Secondary Controller

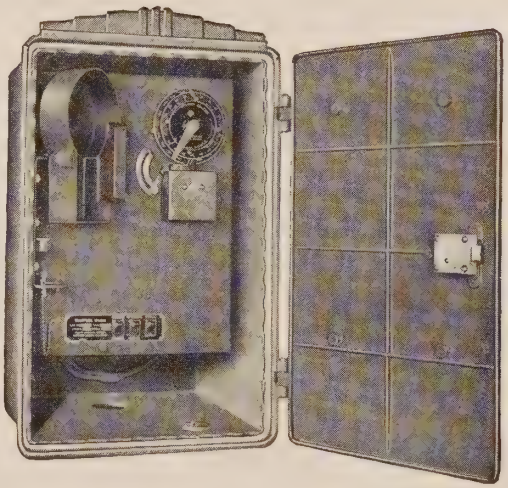


Fig. 1
Type GF *Super-Trafflex* Secondary Controller in Size 22 Cabinet

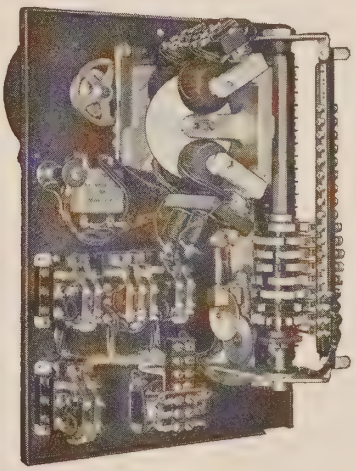


Fig. 2
Type GF *Super-Trafflex* Secondary Controller

The type GF *Super-Trafflex* secondary controller shown above consists of a *Trafflex* motor driving the timing dials, a cam-unit for switching the signal circuits on and off, and a relay panel on which is mounted the remote control feature relays such as shutdown, flashing, and emergency all-red. There is also a fuse and terminal board which provides fusible terminals for the power supply and for all wires in the interconnecting cable, and terminals for the signal circuits. The complete controller is mounted in a cast aluminum weatherproof cabinet, arranged for mounting on a steel pole, a wood pole, or a pedestal.

*A time cycle range of 30 to 90 seconds will be furnished if the order so states.

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Functions of the Secondary Controller

The secondary controllers perform the following functions.

(1) **Division of the Time-Cycle.** Each *Super-Trafflex* secondary controller is equipped with a timing-dial graduated in steps of 1%, from 0% to 100%, for dividing the time-cycle into the desired number of intervals in accordance with pre-determined color-sequence.

(2) **Remote Cycle Change.** The time-cycle of the *Super-Trafflex* secondary controller is changed from the master controller, and can be varied from 40 to 120 seconds. The secondary controllers respond instantly to any change at the master and they remain in step with the master and with each other during any change in time-cycle. No period of resynchronization is required. The change in time-cycle is made by varying the voltage to the bucking coils of both master and secondaries simultaneously and is, therefore, gradual throughout the entire range.

(3) **Establishment of the Offset.** Each *Super-Trafflex* secondary is provided with an offset dial graduated in steps of 1%, from 0% to 100%, for establishing the offset or beginning of the green interval, for obtaining a flexible progressive movement of traffic.

(4) **Check of the Offset.** Each *Super-Trafflex* secondary is provided with a single automatic reset circuit which, in conjunction with the master, automatically checks the offset once each time-cycle to keep all secondaries in step. If any secondary is out of step, it is restored to its correct position within one time-cycle, so that traffic may flow uninterruptedly through the controlled area.

(5) **Relay Equipment for Remote Control Feature.** On the rear of the face-plate there are mounted the relays for the remote control features such as shutdown, flashing, and emergency all-red.

Order of Remote Feature Precedence

Some *Super-Trafflex* control systems may be equipped with all three remote features; namely, shutdown, flashing, and emergency all-red, and when so equipped the flashing feature takes precedence over signal shutdown, and emergency all-red takes precedence over both. With this system of wiring, the fire department may display the emergency signal at any time of the day or night regardless of signal operation.

Continuous Traffic Control

A unique and valuable feature of the Crouse-Hinds *Trafflex* system is that an interruption of the power supply to the master timer, or the failure of the control cable, will not stop the operation of the secondary timers. They will continue to operate and maintain continuous control of the intersection. Interruption of power to any *Trafflex* secondary will not affect any other secondary; and upon the return of power, the secondary so affected will automatically resume its proper time relationship with all other *Trafflex* secondaries.

Isolated Control

Trafflex secondary controllers may also be used as individual isolated controllers, if desired, and later connected to a *Trafflex* master timer to give a flexible-progressive movement of traffic, or they may be disconnected from a flexible-progressive system and operated as isolated timers. To make this change, it is only necessary to insert or remove fuses. This is a most valuable feature since it permits installation of secondaries at congested points. They later may be connected to a *Trafflex* master to control the entire congested area.

Construction

Type GF controllers are built of separate units, each complete in itself. A complete controller consists of a face-plate and dial assembly, a timing-unit, a cam-unit, and a panel assembly. The various units are assembled on the face-plate and wired. The timing-unit and the cam-unit are completely assembled and wired so that each may be removed from the face-plate without disturbing any other piece of equipment. The complete assembly is protected by a dust cover and connected to the field terminal block, mounted on the rear wall of the cabinet, by means of a multi-circuit plug and receptacle. This assembly may be removed from the cabinet without the use of tools.

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Face-Plate and Dial Assembly

Fig. 1
Face-Plate and Dial
Type GF *Super-Trafflex* Controller

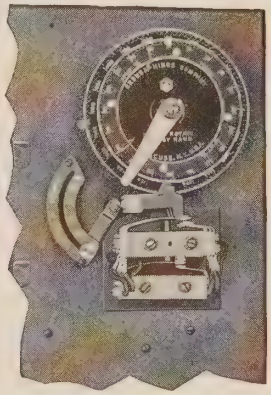


Fig. 2
Dial and Dial Contacts

Figs. 1 and 2 show the face-plate and dial assembly of the *Super-Trafflex* secondary controllers.

The dial consists of two parts. The outer one, marked "Timing-Split Dial," is used only to determine the division of the time-cycle into the number of intervals. The rear or larger dial, marked "Offset Dial," is engraved with two scales marked "A" and "B." The offset arm may be rotated counter-clockwise at will and placed in any hole in the dial.

There are 100 divisions in the offset dial and 100 divisions in the timing-split dial.

The interval percentages are determined by the location of the timing-split keys placed in the holes of the timing-split dial.

Under the dials are the dial contacts, which are used for the interval-indexing, interlock, and reset circuits. These contacts are large and heavy and, since the current is small, will last for a long time.

A hinged cover is placed over the dial and dial contacts, completely enclosing them. This cover is locked with a special screw, opened only with a key, to prevent access by unauthorized persons. If specified on the order, this special screw will be replaced by an ordinary round head screw.

Timing-Unit

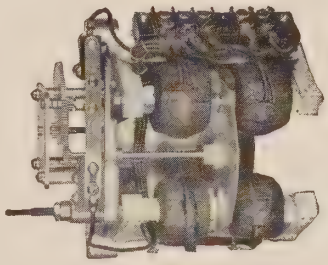


Fig. 3
Timing-Unit
Type GF *Super-Trafflex* Controller

The timing-unit motor has been carefully designed. While of low power consumption, it is powerful and simple. It has exceptionally high torque and its reliability has been proven by many years of successful service. The motor is of the low-speed, disc type, with fully laminated magnetic circuits. The gears for reducing disc speed to timing dial speed are accurately machined gears and pinions. No stamped gears are used. All shafts are equipped with precision ball bearings. Such construction results in a highly-efficient motor, which will operate for long periods of time without any attention other than occasional oilings.

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Cam-Unit—Color Sequence Flexibility

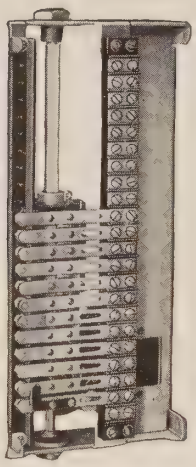


Fig. 4
Cam-Unit

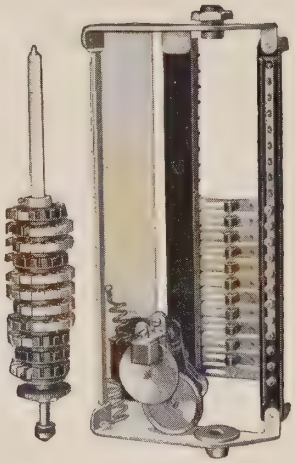


Fig. 5
Cam-Unit with Cam-Shaft Removed

Figs. 4 and 5 show the cam-unit, clearly illustrating its design, simplicity, and accessibility. The cam-unit motor receives electrical impulses from the dial contacts and drives the cam-shaft forward one position at a time. This is a powerful, ball-bearing type motor equipped with brake to prevent coasting. All cam-units provide a maximum of sixteen intervals, but any lesser number of intervals may be used merely by resetting the cam-lobes. This can be done in the field without the use of tools.

The cam-unit has provision for fifteen signal circuits. The bottom cam controls the interval indexing circuit; the next cam controls the circuit which electrically interlocks the cam-unit with the dial contacts; and above these are placed the signal circuit cams. Fifteen signal circuit cams may be used, and to make circuit identification easy, they are moulded in four colors: green, amber, red, and black; the black cams being used for special movements such as "WALK," "WAIT," and "ARROW." A minimum of three signal circuits is provided for each vehicular movement.

A cam-unit originally purchased for six-circuit, four-interval operation may be changed in the field to give six-circuit, five or six-interval operation by resetting the removable lobes in the cams. All cams are identical and may be used for any color sequence. It is merely necessary to change the positions of the lobes.

The Crouse-Hinds cam-unit may be expanded by the addition of cams and contacts, readily installed in the field, to provide for a maximum of fifteen color circuits and sixteen intervals. All fifteen color circuits are wired.

A cam-unit may be set to give two different color sequences, so that either "WALK" intervals or special turning movements may be provided when necessary during rush hours, and dispensed with when no longer required. All color circuits are positive and single acting.

Contacts are large, $\frac{3}{8}$-inch in diameter, and the break is wide and positive. When contacts are closed, there is sufficient pressure to insure positive contact.

Electrical Interlock

The cam-unit and the timing-unit are electrically interlocked and will automatically remain in step.

If for any reason, such as shut-down or manual operation, the cam-unit gets out of step with the timing-unit, the cam-unit will continue to rotate until it comes around to the main street green, where it will dwell in this position until it gets in step with the timing-unit.

When the timer is shut down for the night by means of the time switch or by manual operation, it may be shut down at any time because, although signal colors go out immediately following the operation of the shut-down switch, the cam-shaft continues to rotate until it comes around to main street green position. Therefore, in starting in the morning, the timer will always start on the main street green. The same thing is true if flashing amber is the off-duty indication.

During the display of emergency all-red for the passage of fire apparatus, the signal colors are changed by means of the relays. During this interval the cam-unit and timing-unit remain in their proper relationship: thus, when normal operation is restored they will be in step.

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Terminal Board for Field Connections

Fig. 1 at the right shows the terminal board for fastening to the rear wall of the cabinet. There are six sets of fuse clips at the bottom to take cartridge fuses for the interconnecting cable. Immediately above the fuse clips are terminals for connecting the commons, and above these terminals is a set of fuse clips for the hot wire of the power feed. Above the power fuse are contacts for the fifteen color circuits.

Fig. 1
Field Terminal Board
For Type GF *Super-Trafflex* Controllers

Wiring

All controllers, when shipped from the factory, are completely wired for the maximum of fifteen separate color circuits. This wiring extends from the contact block on the cam-unit, through the jack connection to the terminal board for field connections. A six-circuit controller may be expanded to a nine or fifteen-circuit controller merely by purchasing and installing the necessary cams, stationary contacts, and movable contacts.

Signal Shutdown from Control Headquarters

If so ordered, the Crouse-Hinds *Super-Trafflex* control system will be furnished with auxiliary equipment for shutting down all signals from the master. This feature is used during periods of low-traffic volume, usually at night, when it is safe to discontinue regular traffic control. Each *Super-Trafflex* secondary is equipped with a sub-base wired for this feature and when the order so states the relay will be supplied.

Flashing Operation From Control Headquarters

If so ordered, the Crouse-Hinds *Super-Trafflex* control system will be supplied with auxiliary equipment for providing off-duty flashing operation from control headquarters. This feature is used during periods of low traffic volume when it is desired to discontinue regular traffic control. The flashing lights warn vehicle drivers that they are approaching well-traveled intersections. Each *Super-Trafflex* secondary is equipped with a sub-base wired for this feature, and when the order so states the relay will be supplied. Standard controllers are arranged to flash amber lights to all four streets, but a simple interchange of jumpers permits the flashing of amber lights to the main street and red lights to the cross street.

Emergency All-Red from Control Headquarters

If so ordered, the Crouse-Hinds *Trafflex* control system may be supplied with auxiliary equipment for displaying the red lights in all directions at all intersections from Control Headquarters, thus stopping all traffic for the passage of emergency apparatus such as police, riot, and fire equipment. This emergency all-red feature is obtained by adding a jack-mounted relay to each secondary controller. The relays are energized by a switch in the master controllers. If desired, duplicate switches may be placed in both Fire and Police Headquarters, so that the simple operation of any one of these switches will display the red lights in all directions at all intersections.

The control switch which is supplied in the *Trafflex* master for emergency all-red circuit is a simple toggle switch turned on and off by hand. If desired, this may be replaced by the Crouse-Hinds type AE-2 automatic reset variable timing relay, or by type ME-1 manually operated, self-restoring emergency switch listed and described in Section 602.

Local Manual Switch

Fig. 2
Manual Switch and Cord

Manual Operation

At some intersections it is at times necessary to discontinue automatic control and substitute manual control by a traffic officer. To provide this feature, controllers may be equipped with a manual switch. This is a simple grip switch, mounted within a rubber handle, having an extension cord. All controllers have terminals to which this manual switch may be attached in addition to the necessary switch for throwing from automatic to manual operation.

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Double and Triple Offset

The Crouse-Hinds controllers listed and described in this section are regularly equipped with a dial having a single offset for the setting of the beginning of the green or "GO" interval, to give a flexible-progressive movement of traffic.

In the large majority of cases, the single offset is all that is needed. However, there are exceptional cases when traffic is uni-directional at certain times of the day. A typical example would be a *Trafflex* installation on a through street leading from a densely populated residential district to the center of the city. Under such conditions, a great volume of traffic moves towards the business center for a short time in the morning and away from it in the afternoon.

To meet these conditions, the triple offset may be used to advantage. One offset may be used to favor the inbound morning traffic; another, to favor the outbound afternoon traffic; and the third, for normal traffic conditions. On some streets the use of special offsets for morning and afternoon rush-hour traffic will permit the flow of a greater volume of traffic in the desired direction. This, of course, is accomplished by penalizing the less important opposing traffic.

Not all streets can use the triple offset feature to advantage, and the problem should be thoroughly studied before the extra money is spent. Crouse-Hinds engineers will gladly assist in determining whether or not the triple offset may be used to advantage.

Single Dial Controllers with Two Timing Splits

All Crouse-Hinds type G controllers may be arranged to provide two different timing splits on a single dial. For example, the percentage timing split may be 50-50 during part of the day and 75-25 during other hours when traffic becomes very heavy in one direction. A change may be desirable at certain intersections in the downtown system or at intersections adjacent to large industrial plants.

The change from one timing split to the other may be made at the secondary controller or from the master controller, and may be accomplished by a time switch or by a manually operated switch. If the change is to be made from the master controller it is only necessary to provide one additional wire in the interconnecting cable.

The dial keys for providing the two timing splits are all placed in the timing split dial. None is placed in the offset dial, thus leaving the offset dial free for its assigned purpose.

A transfer relay is provided for changing from one timing split to the other and this relay is wired to the circuit in such a manner that the change is always effective during the main highway green interval. This means that there are no interruptions to service or conflicting signal indications. The controllers remain in step during the change. On controllers providing two timing splits on a single dial the color sequence remains the same during both splits.

Multiple Dial Controllers

The traffic movement at some complicated intersections may vary so much that it is desirable to provide not only different timing splits, but a different color sequence at certain times of the day, and these conditions can be met only with multiple dial controllers. Any Crouse-Hinds *Super-Trafflex* controller can be furnished with either two or three dials, each with its own offset scale.

These multiple dial controllers provide a maximum of flexibility and efficiency in handling traffic. An intersection may operate with two vehicle movements at one time and with three vehicle movements at other times. If the intersection requires three vehicle movements at all times, the order of the movements may be reversed. One dial may be set to give the green signal indication to Highways 1, 2, and 3 in that order, and the other dial set for Highways 1, 3, and 2. Such changes may be advantageous in providing the proper clearance for turning traffic at those intersections having a large physical area.

The change from one dial to another may be made at the secondary controller or from the master controller and may be accomplished by time switches or by manually operated switches. If the change is made remotely from the master controller, it is necessary that the interconnecting cable have one extra wire for two-dial controllers and two extra wires for three-dial controllers.

The Crouse-Hinds Company will gladly assist City authorities in laying out the traffic movements at intersections requiring these multi-dial controllers.

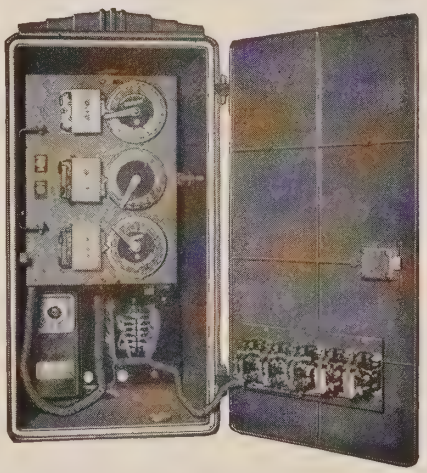


Fig. 3
Type GFTD-4 *Super-Trafflex* Three-Dial
Secondary Controller
Dial Cover Removed

CROUSE-HINDS

Crouse-Hinds *Trafflex* Control System

Wires Required

The minimum number of five wires is required for the *Trafflex* system, providing for complete operation and resynchronization of all secondaries, and for the shutting down and starting up of the system from Control Headquarters. Inasmuch as very little power is required for the operation of the secondary timers, it is seldom necessary to use larger than No. 10 B & S gauge wires in the impulse cable. This makes a very economical installation. One additional conductor is required in the control cable for the remote control from Headquarters of the emergency all-red and another wire for steady or flashing amber.

One very important feature of the *Trafflex* control system is that line drop does not in any way affect the proper operation of the secondary timers. In each of the secondary timers means are provided for compensation for line drop, and proper adjustment of all secondaries to run at their correct speed, regardless of their position on the line.

Wiring

The wiring of the *Trafflex* control system is very simple. Within the master and secondary control cabinets are connection blocks with heavy terminals properly identified for all incoming and outgoing wires. The timer proper may be left in the shop while the field connections are made at the terminal board in the back of the cabinet. After these connections have been made and tested the timer may be hung in the cabinet and the plug inserted into the receptacle. Wires are all held firmly in position and are tied in cables to prevent damage.

Accessibility for Inspection and Maintenance

Super-Trafflex controllers are very simple to operate and are easy to maintain. When the timer is swung out of the cabinet and the dust cover removed, all parts are accessible and in full view.

Stationary contacts and movable contacts are arranged in a single row and may be inspected or replaced in a very few seconds. The entire cam-shaft assembly may be quickly removed without disturbing any of the wiring or any of the contacts. Moreover, simply by breaking the jack connection, the complete timer may be removed from the cabinet. All field wiring is attached to the terminal board in the back. Separate substantial terminal strips with large binding screws are provided for all field connections.

The cabinet is large and roomy with ample space for working and for slack cable.

CROUSE-HINDS

Type GF *Super-Trafflex* Controllers

Extra Equipment and Ordering Instructions

Extra Equipment for Controllers

Description		List, each
Single Dial, Double Automatic Reset	Add to list prices of Single-Dial, Single-Reset Controllers	$ 15.00
Single Dial, Triple Automatic Reset		30.00
Double Dial, Double Automatic Reset		125.00
Triple Dial, Triple Automatic Reset		200.00
Each Additional Circuit, state purpose of each (Limit 15)		4.00
Manual Switch and Cord		7.00
Flasher, built as part of controller mechanism		6.00
Flasher, separate. For use when controller is removed.		25.00
Radio Interference Filter for Flashing Contacts		8.00
Power-Failure Relay Jack, wired		3.00
Power-Failure Relay		9.00
Reset Switch for Power-Failure Relay		3.00
Tell-tale Light for Power-Failure Relay, mounted on top of cabinet		5.00
Tell-tale Lamp mounted on controller panel		3.00
Red Light-Failure Relay Jack, wired	One required for each red lamp protected	6.00
Red Light-Failure Relay		20.00
Reset Switch, for Red Light-Failure Relay (one required per controller)		3.00
Extra Circuits for Flashing Green, for main street only (flasher not included)		24.00★
Extra Circuits for Flashing Green, for main and cross streets (flasher not included)		36.00★
Lamp Receptacle and Convenience Outlet, mounted inside of cabinet		5.00
Extra Hand-Operated Switches, for special circuits such as bell, base light, signs, etc., operated from inside of cabinet		3.00
Extra Hand-Operated Switches, Externally Operated		6.00
Each Time Switch, Space and Wiring (synchronous without reserve spring)		34.00‡
Each Time Switch, Space and Wiring (synchronous with 10-hour reserve spring)		44.00‡
Cabinet Space, Drilling and Wiring for Time Switch (time switch to be furnished by customer)		6.00
Weekly Program Cylinder with Ten Positions per Day		125.00
Time Switch for Ten Operations per Day, for weekly program cylinder		75.00

Instructions for Ordering

Since it is impossible to cover by catalog number all controller variations, the following information is necessary before an order can be filled.

1. Color sequence. Furnish diagram.
2. Voltage and frequency, if other than 115 volts, 60 cycles.
3. Time-cycle range, if other than 40–120 seconds.
4. Flashing mechanism.
   Amber all around
   Amber main street, red cross street.
5. Emergency all-red.
6. Time switch for shutdown.
7. Time switch for flashing (Requires relay)‡
8. Cabinet data.
   Wood-pole brackets, steel-pole bands, 4-inch pedestal adapter, or ground pedestal. State desired mounting.
   Top and bottom hub plates. State size and type. See section 608, page 13. If this information is not given in detail, cabinets will be furnished with YYP85S hub plate, tapped for 1½-inch conduit on both top and bottom of cabinet.
9. Special drilling. Furnish drawing.
10. Paint. If other than Crouse-Hinds standard green, a color sample must be furnished.
11. Extra equipment. See listing above.

★If off-duty flashing amber is not required in conjunction with flashing green, deduct $12.00 from the list price.
‡When time switch is used for flashing a relay is required.

CROUSE-HINDS

Type GFM *Super-Trafflex* Master Controllers

Cabinet Type

Capacity-50 Secondaries* | 115 or 230-Volt, 60-Cycle, A. C.★ | 40 to 120 Seconds Time Cycle‡

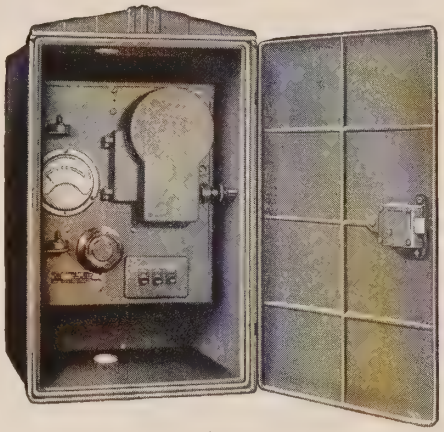


Fig. 1
Type GFM-2 *Super-Trafflex* Master Controller in Size 22 Cabinet

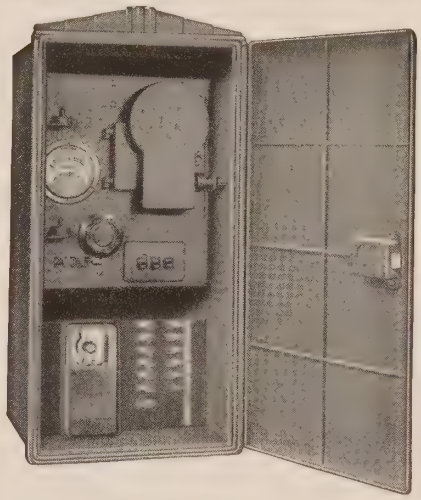


Fig. 2
Type GFM-2 *Super-Trafflex* Master Controller With Time Switch in Size 28 Cabinet

Fig. 3
Dual Type GFM-2 *Super-Trafflex* Master Controller In two Size 28 Cabinets with Ground Pedestal

Type GFM *Super-Trafflex* master controller is used for controlling types GF-4, GF-2, and DF-21 secondary controllers, all of which employ the same reliable and efficient *Trafflex* motor. Listings below cover master controllers mounted in cast aluminum weatherproof cabinets.

Dual Master Controllers

A dual master, as the name implies, consists of two separate and complete master controllers, each in its own cabinet, and switching apparatus mounted in one of the cabinets for changing from one master to the other. On changing from one master to the other, all of the wires in the interconnecting cable are disconnected from one master and reconnected to the other. The two cabinets are bolted together, thus forming a rigid assembly for wood-pole, steel-pole or pedestal mounting.

Listed below are dual master controllers with manually-operated change-over switches and with time switch for the change-over.

Standard Equipment

All Crouse-Hinds *Super-Trafflex* master controllers are furnished completely wired and ready for connection to the power supply and the interconnecting cable. In addition to the *Trafflex* Timer, they include a time-cycle regulator; a time-cycle indicator graduated in seconds; a single automatic reset circuit; hand-operated switches for shutdown, flashing and emergency all-red; cartridge fuse cutouts for each hot wire in the interconnecting cable; and a terminal block for all field connections.

Type GFM-2 *Super-Trafflex* Master Controllers

Description	Cabinet Size		Cat. No.	List, each
With Manually-Operated Switch For Shutdown or Flashing				
Single Master	One	22	46700	$224.00
Dual Master with Manual Change-over	Two	28	46701	548.00
Dual Master with Time Switch Change-over	Two	28	46702	630.00
With Time Switch For Shutdown or Flashing				
Single Master	One	28	46703	$258.00
Dual Master with Manual Change-over	Two	28	46704	582.00
Dual Master with Time Switch Change-over	Two	28	46705	664.00

*For 100 secondary capacity add $50.00 to the above list prices for single masters and $100.00 for dual masters.

Prices include brackets for wood-pole or wall mounting, or adjustable pole bands for steel-pole mounting. Ground pedestal or standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

‡These controllers may be furnished for time-cycle ranges of 30-90 seconds or 20-60 seconds, without extra charge.

Dimensions, section 613.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — **Type GS Synchronous**

6 to 15 Color Circuits — Unit Construction—Jack Mounted — 4 to 16 Intervals

Type GS Synchronous Motor Drive

Since the synchronous motor is inherently a time-keeping device, type GS is a very useful controller for any city. Controllers installed at adjacent intersections will keep in step with each other without any interconnecting cable. However, by installing interconnecting cable, it is possible to obtain all features required by full flexible-progressive operation except the remote control of the time-cycle. Because of its extreme flexibility, type GS controller is built in three different types:

1—Non-Interconnected
2—Future-Interconnected
3—Interconnected

These three types are essentially the same and employ the same face-plate, cam-unit, and timing-unit. They differ only in the auxiliary features for interconnection. Any controller bought for non-interconnected or future-interconnected use may later be expanded to provide interconnected operation, simply by adding standard parts.

Type GS Non-Interconnected Synchronous

The non-interconnected type should be used at adjacent isolated intersections. Such controllers will keep in step with each other and provide a limited-progressive traffic movement. They can be left running twenty-four hours a day or can be shut down or turned to flashing by means of time switches. All non-interconnected controllers are equipped with manual reset circuits. At the time of installation of such controllers, it is well to consider the possibility of future interconnection; and, if this is likely, the future-interconnected type should be purchased since the small additional cost would easily be justified.

Type GS Future-Interconnected Synchronous

Often cities desire to install a signal system, but lack sufficient money for the purchase of cable. The future-interconnected type of controller solves the immediate problem since the signals and controllers may be installed and the interconnecting cable purchased later. Such controllers are similar to the non-interconnected type except that they are designed and wired for interconnection later. The terminal board is designed for interconnection; fuse clips for the interconnecting cable are furnished and remote-control relay subbases for signal shut-down and flashing are installed and wired complete. The automatic reset circuit is also added. Only the remote-control relays are not supplied with future-interconnected controllers. They may be purchased at the time of interconnection and mounted on the relay subbases.

Type GS Interconnected Synchronous

The interconnected type GS controller is the one most generally used in the congested portions of cities and on long thoroughfares leading thereto. Such a system permits progressive signal operation and provides all of the necessary features for perfect control except control of the time-cycle from the master.

By running an interconnecting cable between the controllers, the following additional features may be incorporated in the system: automatic reset, remote shut-down, remote flashing, and remote emergency all-red. In addition to the common wire, one positive wire is required in the cable for each remote-control feature.

Gear-Shift

All type GS controllers are equipped with a hand-operated gear-shift to provide for changes in the time-cycle. When shipped from the factory, all controllers are equipped with five gears to give time-cycles of 40, 50, 60, 70, and 80 seconds.

Gears to give time-cycles of 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 90, 100, 110, and 120 seconds are carried in stock and any five may be substituted for the five standard gears without extra charge.

Special gears in steps of one second will be furnished at an increased price if specified on the order. See page 8 of this section.

Manual Reset

All type GS controllers are equipped with an offset arm and a hand-operated reset switch, with which it is possible to reset the controller and restore the offset or beginning of the green to its proper place for progressive traffic flow, without the use of a stop-watch.

Automatic Reset

Type GS controllers for future-interconnected and for interconnected service are equipped with an automatic reset circuit which, when connected to the master by the interconnecting cable, will automatically check each controller once each time-cycle and, if it is out of step, reset it to its proper time offset in the progressive traffic flow system.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits — Unit Construction—Jack Mounted — **Type GS Synchronous** — 4 to 16 Intervals

Combined Master and Secondary

Any type GS controller may be equipped with auxiliary contacts for supervising all other controllers on the circuit, thus making it possible for one controller to serve not only as a secondary intersection controller, but as a supervisory master as well. This is entirely satisfactory for small systems. For larger systems it is more common practice to install a separate master at some central point.

Construction

Type G controllers are built of separate units, each complete in itself. A complete controller consists of a face-plate and dial assembly, a timing-unit, a cam-unit, and a panel assembly. The various units are assembled on the face-plate and wired. The timing-unit and the cam-unit are completely assembled and wired so that each may be removed from the face-plate without disturbing any other piece of equipment. The complete assembly is protected by a dust cover and connected to the field terminal block, mounted on the rear wall of the cabinet, by means of a multi-circuit plug and receptacle. This assembly can be removed from the cabinet without the use of tools.

Electrical Interlock

The cam-unit and the timing-unit are electrically interlocked and will always remain in step.

If for any reason, such as shut-down or manual operation, the cam-unit gets out of step with the timing-unit, the cam-unit will continue to rotate until it comes around to the main street green, where it will dwell in this position until it gets in step with the timing-unit.

When the timer is shut down for the night by means of the time switch or by manual operation, it can be shut down at any time because, although signal colors go out immediately following the operation of the shut-down switch, the cam-shaft continues to rotate until it comes around to main street green interval. Therefore, in starting in the morning, the timer will always start on the main street green. The same thing is true if flashing amber is the off-duty indication.

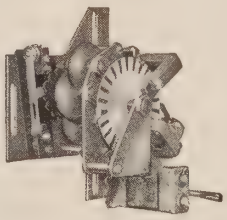


Fig. 1
Timing-Unit
Type GS Synchronous Controller

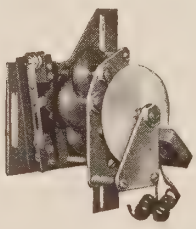


Fig. 2
Timing-Unit
Type GA Variable Controller

Timing-Unit

The timing-unit motors of both controllers are of the low-speed, disc type, revolving at approximately 300 R.P.M. and all shafts are equipped with ball bearings. The magnetic circuit of the motors is of laminated construction, and the result is a highly efficient motor, having a very high torque with a low wattage input. This type of motor has proven successful in traffic signal controller operation for more than 20 years.

The synchronous timing-unit and the variable timing-unit are interchangeable, the only difference between the two is that the timing-unit of the GS synchronous controller has two magnetic circuits instead of one and the motor discs are different. All parts except the discs are interchangeable.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits — Unit Construction—Jack Mounted — **Type GS Synchronous** — 4 to 16 Intervals

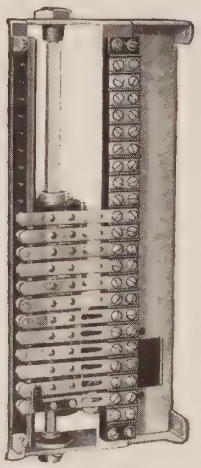


Fig. 3
Cam-Unit

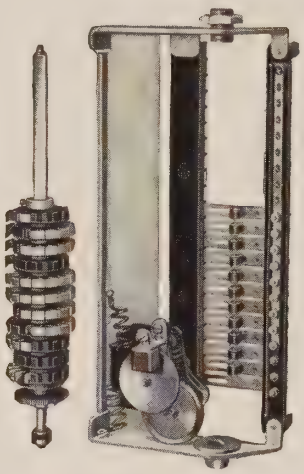


Fig. 4
Cam-Unit with Cam-Shaft Removed

Cam-Unit—Color Sequence Flexibility

Figs. 3 and 4 show the cam-unit, clearly illustrating its design, simplicity, and accessibility. The cam-unit motor receives electrical impulses from the dial contacts and drives the cam-shaft forward one position at a time. This is a powerful, ball-bearing type motor equipped with an electro-dynamic brake to prevent coasting. All cam-units provide a maximum of sixteen intervals, but any lesser number of intervals may be used merely by resetting the cam-lobes. This can be done in the field without the use of tools.

The cam-unit has provision for fifteen circuits in addition to the two control circuits. The bottom cam controls the interval indexing circuit; the next cam controls the circuit which electrically interlocks the cam-unit with the dial contacts; and above these are placed the color circuit cams. Fifteen color circuit cams may be used, and to make circuit identification easy, they are moulded in four colors: green, amber, red, and black; the black cams being used for special movements such as "WALK," "WAIT," and "ARROW." A minimum of three cam circuits is provided for each vehicular movement.

A cam-unit originally purchased for six-circuit, four-interval operation can be changed in the field to give six-circuit, five or six-interval operation by resetting the removable lobes in the cams. All cams are identical and can be used for any color sequence. It is merely necessary to change the positions of the lobes.

The Crouse-Hinds cam-unit can be expanded by the addition of cams and contacts, readily installed in the field, to provide for a maximum of fifteen color circuits and sixteen intervals.

A cam-unit can be set to give two different color sequences, so that either "WALK" intervals or special turning movements can be provided when necessary during rush hours, and dispensed with when no longer required. All color circuits are positive and single acting.

Contacts are large, ⅜-inch in diameter, and the break is wide and positive. When contacts are closed, there is sufficient pressure to insure positive contact.

Accessibility for Inspection and Maintenance

Type G controller is very simple to operate and is easy to maintain. When the timer is swung out of the cabinet and the dust cover removed, all parts are accessible and in full view.

Stationary contacts and movable contacts are arranged in a single row and may be inspected or replaced in a very few seconds. The entire cam-shaft assembly can be quickly removed without disturbing any of the wiring or any of the contacts. Moreover, simply by breaking the jack connection, the complete timer can be removed from the cabinet. All field wiring is attached to the terminal board in the back. Separate substantial terminal strips with large binding screws are provided for all field connections.

The cabinet is large and roomy with ample space for working and for slack cable.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits — Unit Construction—Jack Mounted — **Type GS Synchronous** — 4 to 16 Intervals

Fig. 1
Face-Plate and Dials
Type GS Synchronous Controller

Fig. 2
Face-Plate and Dials
Type GA Variable Controller

Fig. 3
Dial and Dial Contacts

Face-Plate and Dial Assembly

Figs. 1 and 2 above show the face-plates for the controllers. The dials are identical on both.

The dial consists of two parts. The front one, the "Timing-Split Dial," is used only to determine the division of the time cycle into the number of intervals. The rear or larger dial, is the "Offset Dial." The offset arm may be rotated counter-clockwise at will and placed in any hole in the dial.

There are 100 divisions in the offset dial and 100 divisions in the timing-split dial.

The interval percentages are determined by the location of the timing-split keys placed in the holes of the timing-split dial.

Under the dials are the dial contacts, which are used for the interval-indexing, interlock, and reset circuits. These contacts are large and heavy and, since the current is small, will last for a long time.

A hinged cover is placed over the dial and dial contacts, completely enclosing them. This cover is locked with a special screw, opened only with a key, to prevent access by unauthorized persons. If specified on the order, this special screw will be replaced by an ordinary round head screw.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits — Unit Construction—Jack Mounted — 4 to 16 Intervals — **Type GS Synchronous**

Signal Shut-down

A signal shut-down switch is built into every type G controller so that the lights may be turned out. If specified on the order, any controller will be equipped with a time switch for shut-down or with a relay for turning out the lights from some remote point.

Flashing Amber or Amber and Red

For periods of light traffic or late at night, the regular "stop-and-go" operation may be discontinued and the signals turned to flashing amber, or to flashing amber on the main street and flashing red on the cross street.

This can be done locally by means of a manually operated switch or by a time switch. Interconnected controllers are listed complete with remote control relays for off-duty flashing.

The rear panel is equipped with an amber-red flash terminal block to facilitate changing from one flashing indicator to the other. Type G controller provides for both flashing operations by a simple interchange of connections.

Emergency All-Red

Some cities stop all vehicular traffic for the passage of fire apparatus or other emergency vehicles. Any type G controller can be equipped with an emergency all-red feature to be operated either locally by a hand-operated switch or from a remote point by means of a remote control relay.

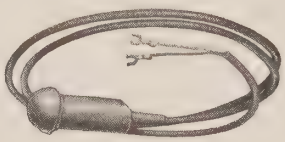


Fig. 4
Manual Switch and Cord

Manual Operation

At some isolated intersections it is at times necessary to discontinue automatic control and substitute manual control by a traffic officer. To provide this feature, type G controllers can be equipped with a manual switch. This is a simple grip switch, mounted within a rubber handle, having an extension cord. All type G controllers have terminals to which this manual switch may be attached in addition to the necessary switch for changing from automatic to manual operation.

Power-Failure Relay

With synchronous controllers for non-interconnected operation where it is necessary to reset the controls by hand, it is often desirable to display a warning at each control box indicating that power has failed and that, consequently, the controller may be out of step.

In order to provide this warning, all type GS synchronous controllers can be equipped with a jack mounted power-failure relay which is normally energized as long as power is in the line. When power fails, the relay coil is de-energized, thus establishing contact with an indicating light mounted on top of the cabinet.

When power is restored, the indicating light continues to burn until the controller is reset in its proper time relationship, and the relay restored to its original position.

Protection Against Burn-out of Red Signal Light

The failure of a red light has been the cause of many accidents due to the fact that when a red light fails on a main highway and there is a green light displayed to cross traffic, the driver on the main highway feels that the signal is not operating and that he may drive safely.

Some cities and states require the use of special equipment known as "red light-failure relays" in each controller for protection against failure of the red light. When any red lamp fails, the relay equipment automatically discontinues normal signal operation and changes the controller to flashing operation. One such red light-failure relay is required for each red lamp so protected, four being required for a four-way signal. It is customary to install a reset button in such controls so that the maintenance man can push the reset button to determine which red light has failed; and after renewing the lamp, restore normal operation. The red light-failure relay is listed on page 8 of this section.

Flashing Green

In some flexible-progressive systems in large cities, the green lights are flashed either at the beginning or at the end to indicate that a vehicle is traveling too fast or too slow and must, consequently, change speed to prevent being stopped by a red light. This feature can be added to any Crouse-Hinds type GS or GF controller and is listed on page 8 of this section.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits — Unit Construction—Jack Mounted — **Type GS Synchronous** — 4 to 16 Intervals

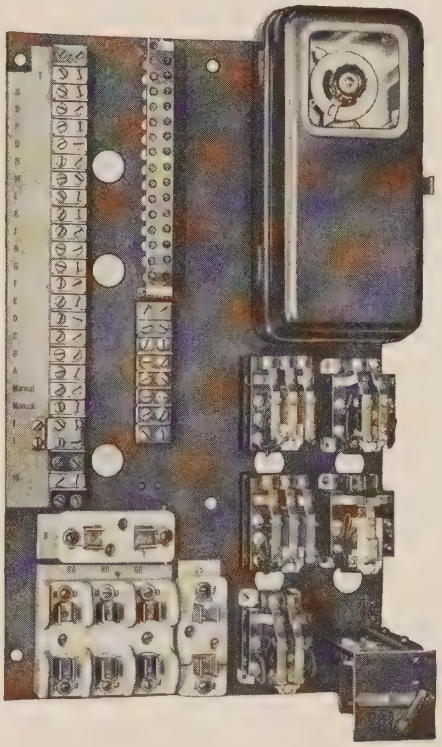


Fig. 1
Rear Panel for GS and GA Controllers

Rear Panel

Figure 1 shows the rear panel for GS and GA controllers on which there are mounted the various pieces of equipment which may be used. Only in rare cases is all of this equipment used, but the panel is drilled and tapped for it. Each piece of equipment has its own particular location and, if not purchased originally, can be added when required.

A simple non-interconnected controller will require only the field terminal blocks, the jack connector, the amber-red flash terminal block, and the main line fuse cutout. An interconnected controller would have all of the above equipment plus the fuse cutouts for the interconnecting cable and one or more of the relays.

Wiring

All controllers, when shipped from the factory, are completely wired for the maximum of fifteen separate color circuits. This wiring extends from the contact block on the cam-unit, through the jack connection and to the terminal board for field connections. A six-circuit controller can be expanded to a nine or fifteen-circuit controller merely by purchasing and installing the necessary cams, stationary contacts, and movable contacts. All fifteen color circuits are wired.

Standard Equipment Furnished with the Various Type G Controllers

Description	Type GS			Type GA
	Non Inter-connected	Future-Inter-connected	Inter-connected	
Hand-Operated Gear Shift with Five Gears	Yes	Yes	Yes	
Local Time-Cycle Control, 40-120 Seconds				Yes
Hand-Operated Local Signal Shut-down Switch	Yes	Yes	Yes	Yes
Hand-Operated Reset Switch	Yes	Yes	Yes	
Remote Automatic Reset Circuit		Yes	Yes	
Automatic to Manual Transfer Switch	Yes	Yes	Yes	Yes
Hand-Operated Amber Switch (flasher not included)	Yes	Yes	Yes	Yes
Fuse Cutout for Power Supply	Yes	Yes	Yes	Yes
Relay Subbase Wired for Signal Shut-down		Yes	Yes	
Relay for Signal Shut-down			★	
Relay Subbase Wired for Flashing Amber		Yes	Yes	
Relay for Flashing Amber			★	
Identified Terminal Board for Field Connections	Yes	Yes	Yes	Yes
Amber-Red Flash Terminal Block	Yes	Yes	Yes	Yes

★See pages 9 and 11 of this section for relays included in catalog numbers and list prices.
•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — **Type GS Synchronous**

Extra Equipment and Ordering Instructions

Extra Equipment for All Controllers

Description		List, each
Single Automatic Reset		$ 15.00
Interrupted Single Automatic Reset	Add to list prices of Single-Dial, Single-Reset Controllers	10.00
Single Dial, Double Automatic Reset		15.00
Single Dial, Triple Automatic Reset		30.00
Double Dial, Double Automatic Reset		125.00
Triple Dial, Triple Automatic Reset		200.00
Each Additional Circuit, state purpose of each (Limit 15)		4.00
Manual Switch and Cord		7.00
Radio Interference Filter for Flashing Contacts		8.00
Power-Failure Relay Jack, wired		3.00
Power-Failure Relay		9.00
Tell-tale Light for Power-Failure Relay, mounted on top of cabinet		5.00
Red Light-Failure Relay Jack, wired	One required for each red lamp protected	6.00
Red Light-Failure Relay		20.00
Reset Switch, for Red Light-Failure Relay (one required per controller)		3.00
Extra Circuits for Flashing Green, for main street only (flasher not included)		24.00★
Extra Circuits for Flashing Green, for main and cross streets (flasher not included)		36.00★
Standard Time-Cycle Gears, for type GS controllers—30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, and 120 seconds.		
Any five furnished with controller		No Extra
For each standard gear over five		1.00
Special Time-Cycle Gears, time-cycle not divisible by five seconds.		
When furnished in place of standard gear		2.00
When purchased separately		3.00
Lamp Receptacle and Convenience Outlet, mounted inside of cabinet		5.00
Extra Hand-Operated Switches, for special circuits such as bell, base light, signs, etc., operated from inside of cabinet		3.00
Extra Hand-Operated Switches, Externally Operated		6.00
Each Time Switch, Space and Wiring (synchronous without reserve spring)		34.00‡
Each Time Switch, Space and Wiring (synchronous with 10-hour reserve spring)		44.00‡
Cabinet Space, Drilling and Wiring for Time Switch (time switch to be furnished by customer)		6.00
Time Extension Unit for prolonging any interval		50.00
Weekly Program Cylinder with Ten Positions per Day		125.00
Time Switch for Ten Operations per Day, for weekly program cylinder		75.00

Instructions for Ordering

Since it is impossible to cover by catalog number all controller variations, the following information is necessary before an order can be filled.

1. Color sequence. Furnish diagram.
2. Voltage and frequency, if other than 115 volts, 60 cycles.
3. Time-cycle gears, for type GS controller, if other than 40, 50, 60, 70, and 80 seconds.
4. Time-cycle range for type GA, if other than 40–120 seconds.
5. Flashing mechanism.
   Amber all around.
   Amber main street, red cross street.
6. Emergency all-red.
7. Time switch for shutdown.
8. Time switch for flashing (Requires relay)‡
9. Cabinet data.
   Wood-pole brackets, steel-pole bands, 4-inch pedestal adapter, or ground pedestal. State desired mounting.
   Top and bottom hub plates. State size and type. See section 608, page 13. If this information is not given in detail, cabinets will be furnished with YYP85S hub plate, tapped for 1½-inch conduit on both top and bottom of cabinet.
10. Special drilling. Furnish drawing.
11. Paint. If other than Crouse-Hinds standard green, a color sample must be furnished.
12. Extra equipment. See listing above.

★If off-duty flashing amber is not required in conjunction with flashing green, deduct $12.00 from the list price.
‡When time switch is used for flashing a relay is required. (See page 10).
•Denotes revision.

CROUSE-HINDS

Type GS-4 Automatic Synchronous Controllers•

With Gear Shift—Adjustable Time-Cycle—40, 50, 60, 70, and 80 Seconds‡

Complete Jack Mounted Controllers in Size 22 Weatherproof Cabinets

6 to 15 Color Circuits, 16 Intervals — 10-Ampere, 115-Volt, 60-Cycle A. C.★

Type GS-4 for Non-Interconnected Operation

With Hand Reset Switch

Number of Vehicle Movements	Two		Three		Four		Five	
Minimum Number of Signal Circuits	Six		Nine		Twelve		Fifteen	
Standard Equipment	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
Without Flashing Mechanism	46488	$180.00	46490	$192.00	46492	$204.00	46494	$216.00
With Flashing Mechanism	46489	186.00	46491	198.00	46493	210.00	46495	222.00

Type GS-4 for Future-Interconnected Operation

With Hand Reset Switch, Automatic Reset Circuit, and Relay Subbases Wired Complete

Number of Vehicle Movements				Two		Three		Four		Five	
Minimum Number of Signal Circuits				Six		Nine		Twelve		Fifteen	
Flashing Mechanism	With Relay Subbases Wired for: Signal Shut-down	Flashing	Emergency All-Red	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
x	x	x		46620	$207.00	46624	$222.00	46628	$234.00	46632	$249.00
	x		x	46621	201.00	46625	216.00	46629	228.00	46633	243.00
x		x	x	46622	$207.00	46626	$225.00	46630	$237.00	46634	$255.00
x	x	x	x	46623	210.00	46627	228.00	46631	240.00	46635	258.00

Type GS-4 for Interconnected Operation

With Hand Reset Switch, Automatic Reset Circuit, and Jack Mounted Remote Control Relays Wired Complete

Number of Vehicle Movements				Two		Three		Four		Five	
Minimum Number of Signal Circuits				Six		Nine		Twelve		Fifteen	
Flashing Mechanism	With Remote Control Relays for: Signal Shut-down	Flashing	Emergency All-Red	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
	No Relays Furnished			46636	$201.00	46644	$216.00	46652	$228.00	46660	$243.00
	x			46637	210.00	46645	225.00	46653	237.00	46661	252.00
x		x		46638	$216.00	46646	$240.00	46654	$252.00	46662	$276.00
			x	46639	210.00	46647	234.00	46655	246.00	46663	270.00
x	x	x		46640	$225.00	46648	$249.00	46656	$261.00	46664	$285.00
	x		x	46641	219.00	46649	243.00	46657	255.00	46665	279.00
x		x	x	46642	$225.00	46650	$261.00	46658	$273.00	46666	$309.00
x	x	x	x	46643	237.00	46651	273.00	46659	285.00	46667	321.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.

Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.

‡These controllers may be furnished with gears for other time-cycles. See listing section 605, page 8.

Extra Equipment, section 605, pages 8 and 10.

Instructions for Ordering, section 605, page 8.

Dimensions, section 613.

•Denotes revision.

CROUSE-HINDS

Type GS Automatic Synchronous Controllers•

With Gear Shift—Adjustable Time-Cycle—40, 50, 60, 70, and 80 Seconds

Complete Jack Mounted Controls in Size 22 Weatherproof Cabinets

6 to 15 Color Circuits, 16 Intervals — 10-Ampere, 115-Volt, 60-Cycle A. C.

Extra Equipment for Non-Interconnected Controllers

On page 9 of this section are listed type GS controllers for non-interconnected operation. Various relays and switches may be added to these controllers to provide special features. Any or all of the features listed below may be added to the non-interconnected controllers.

The prices given below for the flashing amber feature can only be applied to controllers already equipped with the flashing mechanism.

Number of Vehicle Movements	Two	Three	Four	Five
Minimum Number of Signal Circuits	Six	Nine	Twelve	Fifteen
Description	Add to List Prices of Controls			
Signal Shut-down by Remote Relay	$12.00	$12.00	$12.00	$12.00
Signal Shut-down by Local Time Switch	34.00†	34.00†	34.00†	34.00†
Flashing Amber by Remote Relay	12.00★	24.00★	24.00★	36.00★
Flashing Amber by Local Time Switch	46.00★†	58.00★†	58.00★†	70.00★†
Emergency All-Red by Local Manual Switch	15.00	27.00	27.00	39.00
Emergency All-Red by Remote Relay	12.00	24.00	24.00	36.00

Relay Equipment to Convert Future-Interconnected Controllers to Interconnected Controllers

Future-interconnected controllers are listed on page 9 of this section with various combinations of relay subbases. In order to convert these controllers to interconnected controllers, it is only necessary to add the relays listed below. Relays may only be added to controllers for future-interconnected operation, when such controllers are equipped with subbases for the features selected.

The prices given below for the flashing amber feature do not include the flashing mechanism which is a part of the controller proper.

Number of Vehicle Movements	Two	Three	Four	Five
Minimum Number of Signal Circuits	Six	Nine	Twelve	Fifteen
Description	Add to List Prices of Controls			
Signal Shut-down	$9.00	$ 9.00	$ 9.00	$ 9.00
Flashing Amber	9.00★	18.00★	18.00★	27.00★
Emergency All-Red	9.00	18.00	18.00	27.00

Master Supervisory Contacts for Interconnected Controllers

In small interconnected systems using synchronous controllers, it is possible to equip one of the controllers with master supervisory contacts so that this one controller may serve, not only as an intersection controller, but also as a master for all other intersection controllers in the system. The master supervisory contacts are used to check the automatic reset circuit once every time-cycle to keep all controllers in their proper time relationship.

Description	List, each
Master Supervisory Contacts, applied to one control to automatically resynchronize an entire group	$10.00

★Prices cover relay and time switch equipment only and do not include flashing mechanism. If controller is not already equipped with flashing mechanism, it must be added and the list price of the controller increased by $6.00.

†If synchronous time switch with 10-hour reserve spring is required, add $10.00 to the list price.

•Denotes revision.

CROUSE-HINDS

Type GA-4 Automatic Variable Controllers•

Variable Speed—40 to 120 Seconds Time-Cycle‡

Complete Jack Mounted Controllers in Size 22 Weatherproof Cabinets

6 to 15 Color Circuits, 16 Intervals

10-Ampere, 115-Volt, 60-Cycle A. C.★

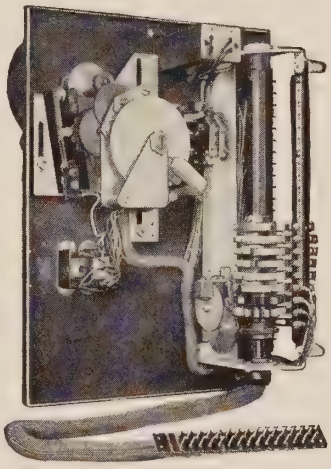


Fig. 1
Type GA-4 Variable Controller
Rear View—Motor Side

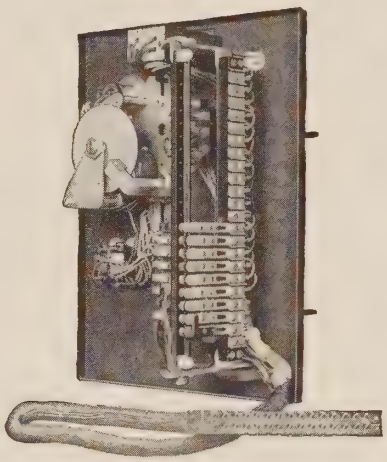


Fig. 2
Type GA-4 Variable Controller
Rear View—Contact Side

Type GA-4 for Non-Interconnected Operation

Number of Vehicle Movements	Two		Three		Four		Five	
Minimum Number of Signal Circuits	Six		Nine		Twelve		Fifteen	
Standard Equipment	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
Without Flashing Mechanism	46480	$180.00	46482	$192.00	46484	$204.00	46486	$216.00
With Flashing Mechanism	46481	186.00	46483	198.00	46485	210.00	46487	222.00
Extra Equipment	**Add to Above List Prices**							
Signal Shut-down by Remote Relay	$12.00		$12.00		$12.00		$12.00	
Signal Shut-down by Local Time Switch	34.00		34.00		34.00		34.00	
Flashing Amber by Remote Relay	12.00		24.00		24.00		36.00	
Flashing Amber by Local Time Switch	46.00		58.00		58.00		70.00	
All-Red by Local Manual Switch	15.00		27.00		27.00		39.00	
All-Red by Remote Relay	12.00		24.00		24.00		36.00	

If cabinet is not desired, deduct $25.00 from list price of complete controller.

Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

‡These controllers may be furnished with time-cycle ranges of 30–90 seconds or 20–60 seconds, without extra charge.

Extra Equipment, section 605, page 8.

Instructions for Ordering, section 605, page 8.

Dimensions, section 613.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits

Type GS Synchronous — Unit Construction—Jack Mounted

Type GF "SUPER-TRAFFLEX" — 4 to 16 Intervals

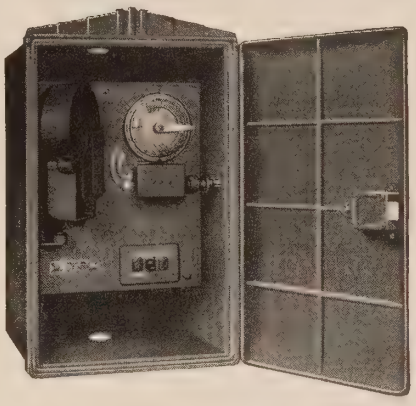


Fig. 1
Type G Traffic Signal Controller
Mounted in Size 22 Cabinet—Doors Open

The type G line of traffic signal controllers is new and modern, designed by the Crouse-Hinds Company as the result of twenty years' experience in the field of traffic control. These controllers are simple, reliable, and sturdy; designed according to the sound engineering practices followed by the Crouse-Hinds Company since the inception of traffic control.

The type G line of controllers covers the entire field of traffic control from the simplest isolated intersection to the most complicated intersection in a full flexible-progressive system. It places in the hands of the traffic engineer a controller for the solution of every signaling problem which may arise.

Types Available—GA Variable, GS Synchronous, and GF "Super-Trafflex"

Type G controllers are made in three separate and distinct models, namely, type GA variable controller, type GS synchronous controller, and type GF "Super-Trafflex" controller, each carefully designed and engineered for its particular field of application. They may be used on the same circuits with the corresponding types in type D line: type GA with type DA-21; type GS with types DSG-21 and DSG-2105; while type GF may be operated on the same circuit, and in conjunction with type DF-21.

Type GA controller is driven by a variable-speed, induction-disc motor and, by simply turning a dial on the face-plate, the time-cycle may be varied throughout a wide range. The standard controller, listed in this section, has a range of 35 to 110 seconds, but it can be furnished without extra charge for ranges of 30 to 90 seconds or 20 to 60 seconds.

Type GA is designed for use at an isolated intersection, but may be used without relays to operate signals at three or four adjacent intersections. By the use of cascade relay boxes, one type GA controller may be used to control all the signals in a group, thus providing a simultaneous or an alternate-simultaneous system of control.

Type GS is driven by a high-torque synchronous motor, requiring a small power input. The synchronous motor is a time-keeping device and the controller will keep in step with the frequency of the supply circuit, making it possible to control signals at adjacent corners and keep them in step without any interconnecting wires other than the power company's network. Type GS controllers may, therefore, be used without any interconnecting cable to give a simultaneous, an alternate-simultaneous, or a limited-progressive system of traffic control.

Type GF "Super-Trafflex" controller is driven by the Crouse-Hinds standard "Trafflex" motor which has proven very efficient and reliable during the past years. This motor employs both driving and bucking coils and provides remote control of the time-cycle. Type GF secondary controllers, when used in conjunction with type GFM master controller or type DFM-21 master controller, provide full flexible-progressive traffic control.

This system provides for remote control of the time-cycle, remote shut-down, remote flashing, remote emergency all-red, control of the offset from zero time, division of the time-cycle into any number of intervals, and automatic supervision of all secondaries.

Crouse-Hinds "Trafflex" system places in the hands of the traffic engineer means for controlling all phases of vehicular and pedestrian traffic.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers

Type GA Variable — 6 to 15 Color Circuits

Type GS Synchronous — Unit Construction—Jack Mounted

Type GF "SUPER-TRAFFLEX" — 4 to 16 Intervals

Construction

Type G controllers are built of separate units, each complete in itself. A complete controller consists of a face-plate and dial assembly, a timing-unit, a cam-unit, and a panel assembly. The various units are assembled on the face-plate and wired. The timing-unit and the cam-unit are completely assembled and wired so that each may be removed from the face-plate without disturbing any other piece of equipment. The complete assembly is protected by a dust cover and connected to the field terminal block, mounted on the rear wall of the cabinet, by means of a multi-circuit plug and receptacle. This assembly may be removed from the cabinet without the use of tools and without breaking any of the electrical connections.

Electrical Interlock

The cam-unit and the timing-unit are electrically interlocked and will always remain in step.

If for any reason, such as shut-down or manual operation, the cam-unit gets out of step with the timing-unit, the cam-unit will continue to rotate until it comes around to the main street green, where it will dwell in this position until it gets in step with the timing-unit.

When the timer is shut down for the night by means of the time switch or by manual operation, it may be shut down at any time because, although signal colors go out immediately following the operation of the shut-down switch, the cam-shaft continues to rotate until it comes around to main street green interval. Therefore, in starting in the morning, the timer will always start on the main street green. The same thing is true if flashing amber is the off-duty indication.

During the display of emergency all-red for the passage of fire apparatus, the signal colors are changed by means of the relays. During this interval the cam-unit and timing-unit remain in their proper relationship: thus, when normal operation is restored they will be in step.

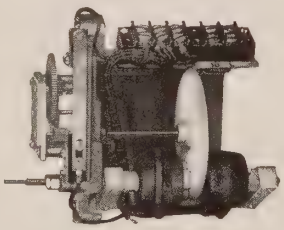


Fig. 2
Timing-Unit
Type GA Variable Controller

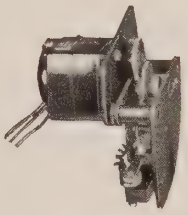


Fig. 3•
Timing-Unit
Type GS Synchronous Controller

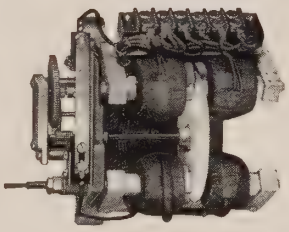


Fig. 4
Timing-Unit
Type GF "Super-Trafflex" Controller

Timing Unit•

Three different timing-units may be obtained: type GA variable, type GS synchronous, and type GF "Super-Trafflex".

Timing-units are ball-bearing throughout and will operate for long periods of time without any attention other than occasional oiling. The timing-units are completely wired and are equipped with separate terminals.

All timing-units have been carefully designed. Motors, while of low power consumption, are powerful, simple and reliable and have proven themselves by many years of service. Low-torque motors have not been used in any Crouse-Hinds controller because such motors are not powerful enough for traffic control service.

•Denotes change in illustration and description.

CROUSE-HINDS

Type G Traffic Signal Controllers

Type GA Variable — 6 to 15 Color Circuits

Type GS Synchronous — Unit Construction—Jack Mounted

Type GF "SUPER-TRAFFLEX" — 4 to 16 Intervals

Fig. 1
Face-Plate and Dials
Type GA Variable Controller

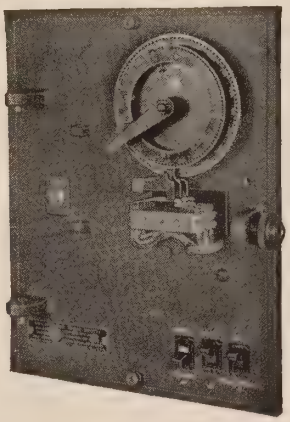


Fig. 2•
Face-Plate and Dials
Type GS Synchronous Controller

Fig. 3
Face-Plate and Dials
Type GF "Super-Trafflex" Controller

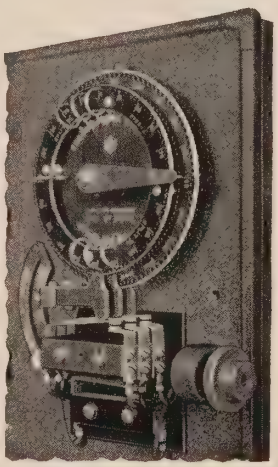


Fig. 4•
Dial and Dial Contacts

Face-Plate and Dial Assembly

Figs. 1 to 3 above show the face-plates for the three controllers. The dials are identical on all three.

The dial consists of two parts. The outer one, marked "Timing-Split Dial," is used only to determine the division of the time cycle into the number of intervals. The rear or larger dial, marked "Offset Dial," is engraved with two scales marked "A" and "B" comparable to the RA and RB scales on the type DF-21 "Trafflex" controller. The offset arm may be rotated counter-clockwise at will and placed in any hole in the dial.

There are 100 divisions in the offset dial and 100 divisions in the timing-split dial.

The interval percentages are determined by the location of the timing-split keys placed in the holes of the timing-split dial.

Under the dials are the dial contacts, which are used for the interval-indexing, interlock, and resynchronizing circuits. These contacts are large and heavy and, since the current is small, will last for a long time.

A hinged cover is placed over the dial and dial contacts, completely enclosing them. This cover is locked with a special screw, opened only with a key, to prevent access by unauthorized persons. If specified on the order, this special screw will be replaced by an ordinary round head screw.

•Denotes change in illustration.

CROUSE-HINDS

Type G Traffic Signal Controllers

Type GA Variable — 6 to 15 Color Circuits

Type GS Synchronous — Unit Construction—Jack Mounted

Type GF "SUPER-TRAFFLEX" — 4 to 16 Intervals

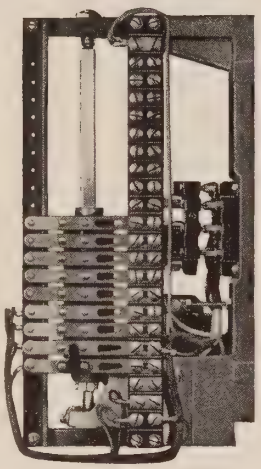


Fig. 5
Cam-Unit

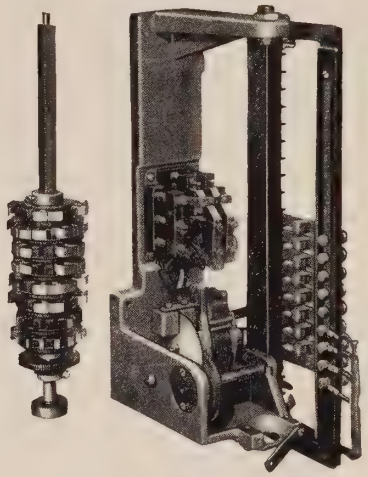


Fig. 6
Cam-Unit with Cam-Shaft Removed

Cam-Unit—Color Sequence Flexibility

Figs. 5 and 6 show the cam-unit, clearly illustrating its design, simplicity, and accessibility. The cam-unit motor receives electrical impulses from the dial contacts and drives the cam-shaft forward one position at a time. This is a powerful, ball-bearing type motor equipped with an electro-dynamic brake to prevent coasting. All cam-units provide a maximum of sixteen intervals, but any lesser number of intervals may be used merely by resetting the cam-lobes. This can be done in the field without the use of tools.

The cam-unit has provision for fifteen circuits in addition to the two control circuits. The bottom cam controls the interval indexing circuit; the next cam controls the circuit which electrically interlocks the cam-unit with the dial contacts; and above these are placed the color circuit cams. Fifteen color circuit cams may be used, and to make circuit identification easy, they are moulded in four colors: green, amber, red, and black; the black cams being used for special movements such as "WALK," "WAIT," and "ARROW." A minimum of three cam circuits is provided for each vehicular movement.

A cam-unit originally purchased for six-circuit, four-interval operation may be changed in the field to give six-circuit, five or six-interval operation by resetting the removable lobes in the cams. All cams are identical and may be used for any color sequence. It is merely necessary to change the positions of the lobes.

The Crouse-Hinds cam-unit may be expanded by the addition of cams and contacts, readily installed in the field, to provide for a maximum of fifteen color circuits and sixteen intervals.

A cam-unit may be set to give two different color sequences, so that either "WALK" intervals or special turning movements may be provided when necessary during rush hours, and dispensed with when no longer required. All color circuits are positive and single acting.

Contacts are large, $\frac{3}{8}$-inch in diameter, and the break is wide and positive. When contacts are closed, there is sufficient pressure to insure positive contact.

On type GS synchronous controllers, the frame of the cam-unit is part of the face-plate assembly. The cam-shaft itself is readily removable for resetting.

Accessibility for Inspection and Maintenance

Type G controller is very simple to operate and is easy to maintain. When the timer is swung out of the cabinet and the dust cover removed, all parts are accessible and in full view.

Stationary contacts and movable contacts are arranged in a single row and may be inspected or replaced in a very few seconds. The entire cam-shaft assembly may be quickly removed without disturbing any of the wiring or any of the contacts. Moreover, simply by breaking the jack connection, the complete timer may be removed from the cabinet. All field wiring is attached to the terminal board in the back. Separate substantial terminal strips with large binding screws are provided for all field connections.

The cabinet is large and roomy with ample space for working and for slack cable.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits

Type GS Synchronous — Unit Construction—Jack Mounted

Type GF "SUPER-TRAFFLEX" — 4 to 16 Intervals

Signal Shut-down

A signal shut-down switch is built into every type G controller so that the lights may be turned out. If specified on the order, any controller will be equipped with a time switch for shut-down or with a relay for turning out the lights from some remote point.

Flashing Amber or Amber and Red

For periods of light traffic or late at night, the regular "stop-and-go" operation may be discontinued and the signals turned to flashing amber, or to flashing amber on the main street and flashing red on the cross street. Type G controller provides for both flashing operations by a simple interchange of connections.

This may be done locally by means of a manually operated switch or by a time switch. Interconnected controllers are listed complete with remote control relays for off-duty flashing.

Emergency All-Red

Some cities stop all vehicular traffic for the passage of fire apparatus or other emergency vehicles. Any type G controller may be equipped with an emergency all-red feature to be operated either locally by a hand-operated switch or from a remote point by means of a remote control relay.

Fig. 1
Manual Switch and Cord

Manual Operation

At some isolated intersections it is at times necessary to discontinue automatic control and substitute manual control by a traffic officer. To provide this feature, type G controllers may be equipped with a manual switch. This is a simple grip switch, mounted within a rubber handle, having an extension cord. All type G controllers have terminals to which this manual switch may be attached in addition to the necessary switch for throwing from automatic to manual operation.

Power-Failure Relay

With synchronous controllers for non-interconnected operation where it is necessary to reset the controls by hand, it is often desirable to display a warning at each control box indicating that power has failed and that, consequently, the controller may be out of step.

In order to provide this warning, all type GS synchronous controllers may be equipped with a jack mounted power-failure relay which is normally energized as long as power is in the line. When power fails, the relay coil is de-energized, thus establishing contact with an indicating light mounted on top of the cabinet.

When power is restored, the indicating light continues to burn until the controller is reset in its proper time relationship, and the relay restored to its original position.

Protection Against Burn-out of Red Signal Light

The failure of a red light has been the cause of many accidents due to the fact that when a red light fails on a main highway and there is a green light displayed to cross traffic, the driver on the main highway feels that the signal is not operating and that he may drive safely.

Some cities and states require the use of special equipment known as "red light-failure relays" in each controller for protection against failure of the red light. When any red lamp fails, the relay equipment automatically discontinues normal signal operation and throws the controller to flashing operation. One such red light-failure relay is required for each red lamp so protected, four being required for a four-way signal. It is customary to install a reset button in such controls so that the maintenance man can push the reset button to determine which red light has failed; and after renewing the lamp, restore normal operation. The red light-failure relay is listed on page 8 of this section.

Flashing Green

In some flexible-progressive systems in large cities, the green lights are flashed either at the beginning or at the end to indicate that a vehicle is traveling too fast or too slow and must, consequently, change speed to prevent being stopped by a red light. This feature may be added to any Crouse-Hinds type GS or GF controller and is listed on page 8 of this section.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits

Type GS Synchronous — Unit Construction—Jack Mounted

Type GF "SUPER-TRAFFLEX" — 4 to 16 Intervals

Terminal Board for Field Connections

Fig. 2 at the right shows a typical terminal board fastened to the rear wall of the cabinet. This particular terminal board is for type GF "Super-Trafflex" controller. There are six sets of fuse clips at the bottom to take cartridge fuses for the interconnecting cable. Immediately above the fuse clips are terminals for connecting the commons, and above these terminals is a set of fuse clips for the hot wire of the power feed. Above the power fuse are contacts for the fifteen color circuits.

The terminal boards for types GA and GS are slightly different.

Wiring

All controllers, when shipped from the factory, are completely wired for the maximum of fifteen separate color circuits. This wiring extends from the contact block on the cam-unit, through the jack connection and to the terminal board for field connections. A six-circuit controller may be expanded to a nine or fifteen-circuit controller merely by purchasing and installing the necessary cams, stationary contacts, and movable contacts. All fifteen color circuits are wired.

Fig. 2
Typical Field Terminal Board
For Type GF "Super-Trafflex" Controllers

Type GA Induction-Disc Motor Drive

Type GA is the simplest controller of all and the one to use at the isolated intersection no matter how complicated it may be. In most cities there are usually several large irregular intersections caused by circles or by several intersecting streets, where it is necessary to separate the traffic flow into three, four, or even five movements. When such intersections are not a part of, or immediately adjacent to, a flexible-progressive group, the simple type GA controller answers every purpose. This controller is listed for two, three, four, and five vehicular movements, and by the addition of standard parts can be equipped with a time switch for shut-down or flashing and with relays for remote emergency all-red control.

The timing-unit of type GA controller has a fully laminated magnetic circuit, which gives high efficiency with a low power consumption. The time-cycle is changed by moving an arm on the face-plate over a dial graduated in seconds, while the split in time is adjusted by moving keys in the dial. All adjustments can be made while the timer is in operation.

Type GS Synchronous Motor Drive

Since the synchronous motor is inherently a time-keeping device, type GS is a very useful controller for any city. Controllers installed at adjacent intersections will keep in step with each other without any interconnecting cable. However, by installing interconnecting cable, it is possible to obtain all features required by full flexible-progressive operation except the remote control of the time-cycle. Because of its extreme flexibility, type GS controller is built in three different types:

1—Non-Interconnected
2—Future-Interconnected
3—Interconnected

These three types are essentially the same and employ the same face-plate, cam-unit, and timing-unit. They differ only in the auxiliary features for interconnection. Any controller bought for non-interconnected or future-interconnected use may later be expanded to provide interconnected operation, simply by adding standard parts.

Type GS Non-Interconnected Synchronous

The non-interconnected type should be used at adjacent isolated intersections. Such controllers will keep in step with each other and provide a limited-progressive traffic movement. They may be left running twenty-four hours a day or may be shut down or turned to flashing by means of time switches. All non-interconnected controllers are equipped with hand-resynchronizing circuits. At the time of installation of such controllers, it is well to consider the possibility of future interconnection; and, if this is likely, the future-interconnected type should be purchased since the small additional cost would easily be justified.

•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers•

Type GA Variable — 6 to 15 Color Circuits

Type GS Synchronous — Unit Construction—Jack Mounted

Type GF "SUPER-TRAFFLEX" — 4 to 16 Intervals

Type GS Future-Interconnected Synchronous

Often cities desire to install a signal system, but lack sufficient money for the purchase of cable. The future-interconnected type of controller solves the immediate problem since the signals and controllers may be installed and the interconnecting cable purchased later. Such controllers are similar to the non-interconnected type except that they are designed and wired for interconnection later. The terminal board is designed for interconnection; fuse clips for the interconnecting cable are furnished and remote-control relay subbases for signal shut-down and flashing are installed and wired complete. The automatic resynchronizing circuit is also added. Only the remote-control relays are not supplied with future-interconnected controllers. They may be purchased at the time of interconnection and mounted on the relay subbases.

Type GS Interconnected Synchronous

The interconnected type GS controller is the one most generally used in the congested portions of cities and on long thoroughfares leading thereto. Such a system permits progressive signal operation and provides all of the necessary features for perfect control except control of the time-cycle from the master.

By running an interconnecting cable between the controllers, the following additional features may be incorporated in the system: automatic reset, remote shut-down, remote flashing, and remote emergency all-red. In addition to the common wire, one positive wire is required in the cable for each remote-control feature.

Gear Shift

All type GS controllers are equipped with a hand-operated gear shift to provide for changes in the time-cycle. When shipped from the factory, all controllers are equipped with five gears to give time-cycles of 40, 50, 60, 70, and 80 seconds.

Gears to give time-cycles of 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 90, 100, 110, and 120 seconds are carried in stock and any five may be substituted for the five standard gears without extra charge.

Special gears in steps of one second will be furnished at an increased price if specified on the order. See page 8 of this section.

Hand Reset

All type GS controllers are equipped with an offset arm and a hand-operated reset switch, with which it is possible to resynchronize the controller and restore the offset or beginning of the green to its proper place for progressive traffic flow.

Automatic Reset

Type GS controllers for future-interconnected and for interconnected service are equipped with an automatic reset circuit which, when connected to the master by the interconnecting cable, will automatically check each controller once each time-cycle and reset it to its proper time offset in the progressive traffic flow system.

Combined Master and Secondary

Any type GS controller may be equipped with auxiliary contacts for supervising all other controllers on the circuit, thus making it possible for one controller to serve not only as a secondary intersection controller, but as a supervisory master as well. This is entirely satisfactory for small systems. For larger systems it is more common practice to install a separate master at some central point.

Standard Equipment Furnished with the Various Type G Controllers

Description	Type GS			Type GA	Type GF
	Non Interconnected	Future-Interconnected	Interconnected		
Hand-Operated Gear Shift with Five Gears	Yes	Yes	Yes		
Local Time-Cycle Control, 35–110 Seconds				Yes	
Remote Time-Cycle Control, 40–120 Seconds					Yes
Hand-Operated Local Signal Shut-down Switch	Yes	Yes	Yes	Yes	Yes
Hand-Operated Reset Switch	Yes	Yes	Yes		
Remote Automatic Reset Circuit		Yes	Yes		Yes
Automatic to Manual Transfer Switch	Yes	Yes	Yes	Yes	Yes
Hand-Operated Amber Switch (flasher not included)	Yes	Yes	Yes	Yes	Yes
Fuse Cutout for Power Supply	Yes	Yes	Yes	Yes	Yes
Relay Subbase Wired for Signal Shut-down		Yes	Yes		Yes
Relay for Signal Shut-down			★		★
Relay Subbase Wired for Flashing Amber		Yes	Yes		Yes
Relay for Flashing Amber			★		★
Terminal Board for Field Connections	Yes	Yes	Yes	Yes	Yes

★See pages 9, 11, and 12 of this section for relays included in catalog numbers and list prices.
•Denotes revision.

CROUSE-HINDS

Type G Traffic Signal Controllers

Type GA Variable **Type GS Synchronous** **Type GF "SUPER-TRAFFLEX"**

Extra Equipment and Ordering Instructions

Extra Equipment for All Controllers•

Description		List, each
Single Automatic Reset		$ 15.00
Interrupted Single Automatic Reset	Add to list prices of Single-Dial, Single-Reset Controllers	10.00
Single Dial, Double Automatic Reset		15.00
Single Dial, Triple Automatic Reset		30.00
Double Dial, Double Automatic Reset		125.00
Triple Dial, Triple Automatic Reset		200.00
Each Additional Circuit (Limit 15)		4.00
Manual Switch and Cord		7.00
Radio Interference Suppressor for Flashing Contacts		8.00
Power-Failure Relay Jack, wired		3.00
Power-Failure Relay		9.00
Tell-tale Light for Power-Failure Relay, mounted on top of cabinet		5.00
Red Light-Failure Relay Jack, wired	One required for each red lamp protected	6.00
Red Light-Failure Relay		20.00
Reset Switch, for Red Light-Failure Relay (one required per control)		3.00
Extra Circuits for Flashing Green, for main street only (flasher not included)		24.00★
Extra Circuits for Flashing Green, for main and cross streets (flasher not included)		36.00★
Standard Time-Cycle Gears, for type GS controllers—30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, and 120 seconds.		
Any five furnished with controller		No Extra
For each standard gear over five		1.00
Special Time-Cycle Gears, time-cycle not divisible by five seconds.		
When furnished in place of standard gear		2.00
When purchased separately		3.00
Lamp Receptacle and Convenience Outlet, mounted inside of cabinet		5.00
Extra Hand-Operated Switches, for special circuits such as bell, base light, signs, etc., operated from inside of cabinet		3.00
Extra Hand-Operated Switches, Externally Operated		6.00
Each Time Switch (synchronous without reserve spring)		34.00
Each Time Switch (synchronous with 10-hour reserve spring)		44.00
Cabinet Space, Drilling and Wiring for Time Switch (time switch to be furnished by customer)		6.00
Time Extension Unit for prolonging any interval		50.00
Weekly Program Cylinder with Ten Positions per Day		125.00
Time Switch with Ten Operations per Day, for weekly program cylinder		75.00

Instructions for Ordering

Since it is impossible to cover by catalog number all control variations, the following information is necessary before an order can be filled.

1. Color sequence. Furnish diagram.
2. Voltage and frequency, if other than 115 volts, 60 cycles.
3. Time-cycle gears, for type GS controller, if other than 40, 50, 60, 70, and 80 seconds.
4. Time-cycle range for types GA and GF controllers: 35–110 seconds, 40–120 seconds, 30–90 seconds, or 20–60 seconds. The standard range is 35 to 110 seconds for type GA and 40 to 120 seconds for type GF, and will be furnished if order does not state another range.
5. Manual switch and cord.
6. Additional signal circuits. State purpose of each.
7. Operating features.

	Hand-Operated Local Switch	Remote Relay	Local Time Switch
Signal Shut-down	†[illegible]	[illegible]	[illegible]
Flashing Amber	[illegible]	[illegible]	[illegible]
Flashing Amber and Red	[illegible]	[illegible]	[illegible]
Steady Amber	[illegible]	[illegible]	[illegible]
Emergency All-Red	[illegible]	[illegible]	[illegible]

8. Cabinet data.
   Wood-pole straps, steel-pole bands, 4-inch pedestal adapter, or ground pedestal. State desired mounting.
   Top and bottom hub plates. State size and type. See section 608, page 13. If this information is not given in detail, cabinets will be furnished with YYP85S hub plate, tapped for 1½-inch conduit on both top and bottom of cabinet.
9. Special drilling. Furnish drawing.
10. Paint. If other than Crouse-Hinds standard green, a color sample must be furnished.
11. Extra equipment. See listing above.

★If off-duty flashing amber is not required in conjunction with flashing green, deduct $12.00 from the list price.
†Furnished on all controllers.
•Denotes revised listing.

CROUSE-HINDS

Type GS-3 Automatic Synchronous Controllers•

With Gear Shift—Adjustable Time-Cycle—40, 50, 60, 70, and 80 Seconds‡

Complete Jack Mounted Controls in Size 22 Weatherproof Cabinets

6 to 15 Color Circuits, 16 Intervals — 10-Ampere, 115-Volt, 60-Cycle A. C.★

Type GS-3 for Non-Interconnected Operation

With Hand Reset Switch

Number of Vehicle Movements	Two		Three		Four		Five	
Minimum Number of Signal Circuits	Six		Nine		Twelve		Fifteen	
Standard Equipment	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
Without Flashing Mechanism	46718	$180.00	46720	$192.00	46722	$204.00	46724	$216.00
With Flashing Mechanism	46719	186.00	46721	198.00	46723	210.00	46725	222.00

Type GS-3 for Future-Interconnected Operation

With Hand Reset Switch, Automatic Reset Circuit, and Relay Subbases Wired Complete

Number of Vehicle Movements				Two		Three		Four		Five	
Minimum Number of Signal Circuits				Six		Nine		Twelve		Fifteen	
Flashing Mechanism	With Relay Subbases Wired for: Signal Shut-down	Flashing	Emergency All-Red	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
x	x	x		46726	$207.00	46730	$222.00	46734	$234.00	46738	$249.00
	x		x	46727	201.00	46731	216.00	46735	228.00	46739	243.00
x		x	x	46728	$207.00	46732	$225.00	46736	$237.00	46740	$255.00
x	x	x	x	46729	210.00	46733	228.00	46737	240.00	46741	258.00

Type GS-3 for Interconnected Operation

With Hand Reset Switch, Automatic Reset Circuit, and Jack Mounted Remote Control Relays Wired Complete

Number of Vehicle Movements				Two		Three		Four		Five	
Minimum Number of Signal Circuits				Six		Nine		Twelve		Fifteen	
Flashing Mechanism	With Remote Control Relays for: Signal Shut-down	Flashing	Emergency All-Red	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
	No Relays Furnished			46742	$201.00	46750	$216.00	46758	$228.00	46766	$243.00
	x			46743	210.00	46751	225.00	46759	237.00	46767	252.00
x		x		46744	$216.00	46752	$240.00	46760	$252.00	46768	$276.00
			x	46745	210.00	46753	234.00	46761	246.00	46769	270.00
x	x	x		46746	$225.00	46754	$249.00	46762	$261.00	46770	$285.00
	x		x	46747	219.00	46755	243.00	46763	255.00	46771	279.00
x		x	x	46748	$225.00	46756	$261.00	46764	$273.00	46772	$309.00
x	x	x	x	46749	237.00	46757	273.00	46765	285.00	46773	321.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.

Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

‡These controllers may be furnished with gears for other time-cycles. See listing section 605, page 8.

Extra Equipment, section 605, pages 8 and 10.

Instructions for Ordering, section 605, page 8.

Dimensions, section 613.

•Denotes revision.

CROUSE-HINDS

Type GS Automatic Synchronous Controllers•

With Gear Shift—Adjustable Time-Cycle—40, 50, 60, 70, and 80 Seconds

Complete Jack Mounted Controls in Size 22 Weatherproof Cabinets

6 to 15 Color Circuits, 16 Intervals — 10-Ampere, 115-Volt, 60-Cycle A. C.

Extra Equipment for Non-Interconnected Controllers

On page 9 of this section are listed type GS controllers for non-interconnected operation. Various relays and switches may be added to these controllers to provide special features. Any or all of the features listed below may be added to the non-interconnected controllers.

The prices given below for the flashing amber feature can only be applied to controllers already equipped with the flashing mechanism.

Number of Vehicle Movements	Two	Three	Four	Five
Minimum Number of Signal Circuits	Six	Nine	Twelve	Fifteen
Description	Add to List Prices of Controls			
Signal Shut-down by Remote Relay	$12.00	$12.00	$12.00	$12.00
Signal Shut-down by Local Time Switch	34.00†	34.00†	34.00†	34.00†
Flashing Amber by Remote Relay	12.00★	24.00★	24.00★	36.00★
Flashing Amber by Local Time Switch	46.00★†	58.00★†	58.00★†	70.00★†
Emergency All-Red by Local Manual Switch	15.00	27.00	27.00	39.00
Emergency All-Red by Remote Relay	12.00	24.00	24.00	36.00

Relay Equipment to Convert Future-Interconnected Controllers to Interconnected Controllers

Future-interconnected controllers are listed on page 9 of this section with various combinations of relay subbases. In order to convert these controllers to interconnected controllers, it is only necessary to add the relays listed below. Relays may only be added to controllers for future-interconnected operation, when such controllers are equipped with subbases for the features selected.

The prices given below for the flashing amber feature do not include the flashing mechanism which is a part of the controller proper.

Number of Vehicle Movements	Two	Three	Four	Five
Minimum Number of Signal Circuits	Six	Nine	Twelve	Fifteen
Description	Add to List Prices of Controls			
Signal Shut-down	$9.00	$ 9.00	$ 9.00	$ 9.00
Flashing Amber	9.00★	18.00★	18.00★	27.00★
Emergency All-Red	9.00	18.00	18.00	27.00

Master Supervisory Contacts for Interconnected Controllers

In small interconnected systems using synchronous controllers, it is possible to equip one of the controllers with master supervisory contacts so that this one controller may serve, not only as an intersection controller, but also as a master for all other intersection controllers in the system. The master supervisory contacts are used to check the automatic reset circuit once every time-cycle to keep all controllers in their proper time relationship.

Description	List, each
Master Supervisory Contacts, applied to one control to automatically resynchronize an entire group	$10.00

★Prices cover relay and time switch equipment only and do not include flashing mechanism. If controller is not already equipped with flashing mechanism, it must be added and the list price of the controller increased by $6.00.

†If synchronous time switch with 10-hour reserve spring is required, add $10.00 to the list price.

•Denotes revision.

CROUSE-HINDS

Type GF-2 "SUPER-TRAFFLEX" Secondary Controls

40 to 120 Seconds Total Period‡

Complete Jack Mounted Controls in Size 22 Weatherproof Cabinets

6 to 15 Color Circuits, 16 Intervals — **10-Ampere, 115-Volt, 60-Cycle A. C.★**

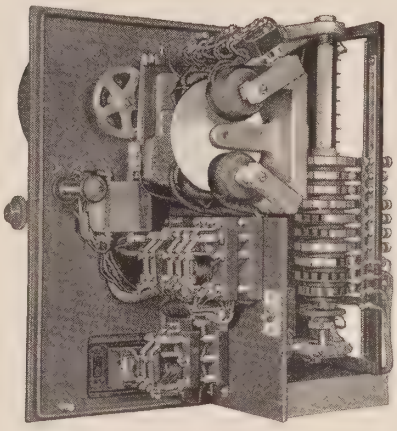


Fig. 1
Type GF-2 "Super-Trafflex" Control
Rear View—Motor Side

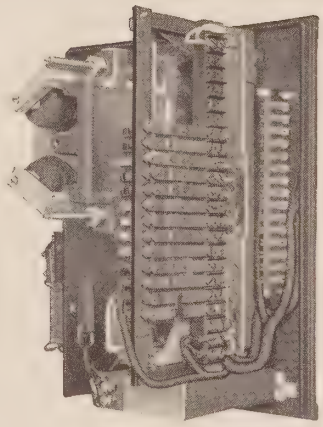


Fig. 2
Type GF-2 "Super-Trafflex" Control
Rear View—Contact Side

Type GF-2 for Full Flexible-Progressive Operation

Number of Vehicle Movements				Two		Three		Four		Five	
Minimum Number of Signal Circuits				Six		Nine		Twelve		Fifteen	
Flashing Mechanism	With Remote Control Relays for			Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
	Signal Shut-down	Flashing	Emergency All-Red								
	No Relays Furnished			46574	$221.00	46582	$236.00	46590	$248.00	46598	$263.00
	x			46575	230.00	46583	245.00	46591	257.00	46599	272.00
x		x		46576	$236.00	46584	$260.00	46592	$272.00	46600	$296.00
			x	46577	230.00	46585	254.00	46593	266.00	46601	290.00
x	x	x		46578	$245.00	46586	$269.00	46594	$281.00	46602	$305.00
	x		x	46579	239.00	46587	263.00	46595	275.00	46603	299.00
x		x	x	46580	$245.00	46588	$281.00	46596	$293.00	46604	$329.00
x	x	x	x	46581	257.00	46589	293.00	46597	305.00	46605	341.00

If cabinet is not desired, deduct $25.00 from list price of complete control.

Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

‡These controls may be furnished with total period ranges of 30–90 seconds or 20–60 seconds, without extra charge.

Extra Equipment, section 605, page 8.
Instructions for Ordering, section 605, page 8.
Dimensions, section 613.

CROUSE-HINDS

Type GA-2 Automatic Variable Controls

Variable Speed—35 to 110 Seconds Total Period‡

Complete Jack Mounted Controls in Size 22 Weatherproof Cabinets

6 to 15 Color Circuits, 16 Intervals

10-Ampere, 115-Volt, 60-Cycle A. C.★

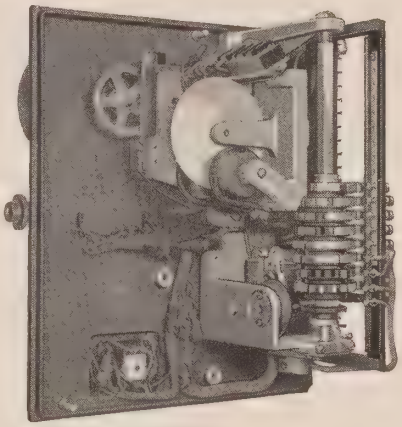


Fig. 3
Type GA-2 Variable Control
Rear View—Motor Side

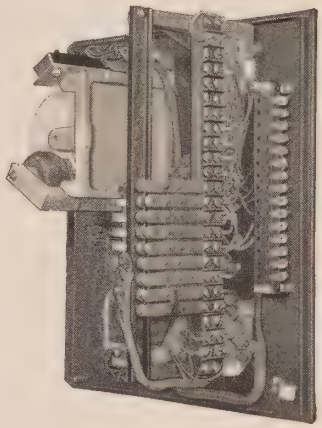


Fig. 4
Type GA-2 Variable Control
Rear View—Contact Side

Type GA-2 for Non-Interconnected Operation

Number of Vehicle Movements	Two		Three		Four		Five	
Minimum Number of Signal Circuits	Six		Nine		Twelve		Fifteen	
Standard Equipment	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
Without Flashing Mechanism	46510	$180.00	46512	$192.00	46514	$204.00	46516	$216.00
With Flashing Mechanism	46511	186.00	46513	198.00	46515	210.00	46517	222.00
Extra Equipment	**Add to Above List Prices**							
Signal Shut-down by Remote Relay		$12.00		$12.00		$12.00		$12.00
Signal Shut-down by Local Time Switch		34.00		34.00		34.00		34.00
Flashing Amber by Remote Relay		12.00		24.00		24.00		36.00
Flashing Amber by Local Time Switch		46.00		58.00		58.00		70.00
All-Red by Local Manual Switch		15.00		27.00		27.00		39.00
All-Red by Remote Relay		12.00		24.00		24.00		36.00

If cabinet is not desired, deduct $25.00 from list price of complete control.

Prices include straps for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

★For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

‡These controls may be furnished with total period ranges of 30–90 seconds or 20–60 seconds, without extra charge.

Extra Equipment, section 605, page 8.
Instructions for Ordering, section 605, page 8.
Dimensions, section 613.

CROUSE-HINDS

Type TFR Traffic Flow Regulator

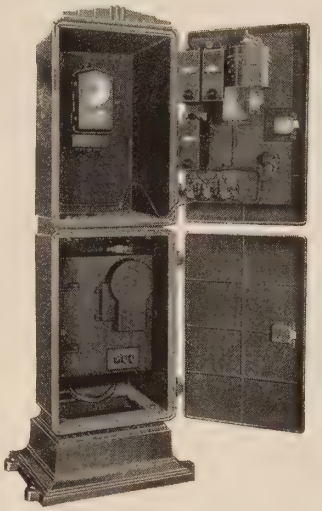


Fig. 1•
Type TFR Traffic Flow Regulator

The Crouse-Hinds Traffic Flow Regulator is a traffic signal controller, built on an entirely new principle, which fully meets the demand for a controller to handle traffic at those intersections where traffic varies greatly in volume and direction during the different times of the day. An intersection timed for light, off-peak traffic will be hopelessly clogged during periods of heavy traffic, and, if timed for heavy traffic, causes annoying and useless delays when the peak load has passed.

The Traffic Flow Regulator solves the problem by operating on a short time-cycle during the off-peak hours, and automatically extending the time allowed for any or all traffic movements during the rush hours, thus maintaining the intersection at maximum efficiency at all times.

Its field is unlimited, since it may be applied equally well to the simple intersection of two streets crossing at right angles, and to complicated irregular intersections. Installed at any intersection where the traffic flow varies, it will increase the efficiency by passing traffic quickly and smoothly, and will eliminate useless delays.

On the following pages, something of the accomplishments of this new traffic signal timing device is given, and it is shown how it may be applied to the varying traffic problem.

The traffic signal engineering staff of the Crouse-Hinds Company is available for the solution of traffic problems. The Traffic Flow Regulator can be applied to the most difficult corners, solving the problem with an ease that is amazing.

The Traffic Flow Regulator, designed and manufactured by the Crouse-Hinds Company, is the most flexible traffic signal controller available to traffic engineers today. It is the one controller particularly designed to handle successfully the so-called "hard" corner where ordinary controllers have proven so ineffective. At an intersection where the traffic flow varies hourly during the day, and from day to day, the Traffic Flow Regulator functions perfectly, passing a maximum number of vehicles with a minimum of delay.

When traffic is light on both intersecting streets, it operates on a short time-cycle, thus passing vehicles and pedestrians rapidly. When one street gets busy, the time for that street is automatically extended; and when the rush is over, the period is automatically shortened. If both streets become busy, the time for both streets is lengthened, thus causing fewer stops to traffic. A bothersome left turn during the peak traffic is conveniently handled during the time when it is most needed, and omitted when not required.

A fifth street, which may be safely handled with another one during periods of light traffic but which causes much confusion during certain hours of the day, is safely handled by the Traffic Flow Regulator.

The morning rush-hour, noon-hour, afternoon rush-hour, night pleasure driving, Saturday afternoon traffic to beaches and resorts, school traffic, church traffic, etc., are all different—different in volume and direction; yet the Traffic Flow Regulator takes care of them all—increasing the "GO" interval in the desired direction at the proper time, passing the increased traffic, and returning to normal timing when the rush is over.

Whatever time is necessary to pass traffic in either direction at any hour of the day, is automatically allotted by the Traffic Flow Regulator. It can repeat the same schedule from day to day or, if necessary, the schedule may be changed from day to day.

Ordinary traffic peaks repeat themselves on business days but they differ widely on Saturdays, Sundays, and holidays. The Traffic Flow Regulator has a weekly program cylinder and can allot increased time to any traffic movement during any hour of any day of the week.

Instructions for Ordering: The Traffic Flow Regulator is listed on page 8, and it should be ordered by catalog number. In ordering, the voltage and frequency of the power line should be stated. Listings are given for 115-volt, 60-cycle only but the Traffic Flow Regulator may be supplied for any ordinary commercial alternating current distribution circuit.

Since the internal connections will vary with the number of time allowance elements required and the use to which each is put, the order should give this information. One time allowance element is required for each special movement:

1. Lengthening the Main Street Green
2. Lengthening Cross Street Green
3. Special Pedestrian Movement
4. Special Left-Turn Movement
5. Special Movement for an Odd Street

From one to four time allowance elements can be furnished with each Traffic Flow Regulator. Special movements for pedestrians, left turns, or the odd street follow the usual change interval. Special Traffic Flow Regulators having five, six, or seven time allowance elements can be furnished on special order.

•Denotes change in illustration.

Type TFR Traffic Flow Regulator

The Traffic Day

The traffic day may be conveniently divided into ten periods, governed solely by the hills and valleys in the traffic flow curves. The hours of these traffic periods may vary somewhat in different cities, but they will be somewhat like those tabulated below:

Starting Time to 8:30 A. M.	Early Morning Traffic
8:30 A. M. to 9:00 A. M.	Morning Rush-Hours
9:00 A. M. to 12:00 Noon	Morning Off-Peak Hours
12:00 Noon to 1:30 P. M.	Noon-Hour
1:30 P. M. to 4:30 P. M.	Afternoon Off-Peak Hours
4:30 P. M. to 6:00 P. M.	Afternoon Rush-Hours
6:00 P. M. to 7:30 P. M.	Dinner Off-Peak Hours
7:30 P. M. to 9:00 P. M.	Theatre Traffic
9:00 P. M. to Midnight	Evening Traffic
Midnight to Starting Time	Off-Duty

The program cylinder provides for these ten periods, and during any or all of them, time may be added to any or all of the traffic movements, or the normal off-peak traffic cycle may be employed. The different traffic periods are set up on the time clock, which transmits impulses to the program cylinder at the beginning and at the end of each of the periods. The setting of the program cylinder determines whether or not time is to be added to any of the traffic movements.

Time Allowance Elements

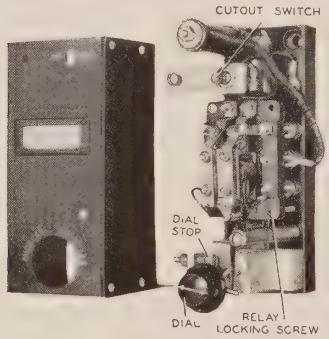


Fig. 2
Time Allowance Element
Cover Removed

With the Traffic Flow Regulator there is, of course, an automatic variable timing switch which is set on a short traffic cycle, 15 or 20 seconds for each direction—just sufficient to prevent traffic from piling up during light traffic hours. In the Traffic Flow Regulator there are a number of time allowance elements which may be introduced into the circuits of the timer, thus increasing the time allowance for the movements which they control. In the simplest form there are two of these time allowance elements, one for increasing the time on each of the intersecting streets. Increased time up to a minute may be added to each movement according to the setting of the dial.

Other time allowance elements may be introduced for controlling left-turn movements, pedestrian movements, or for allowing time to an odd street. The increased time allowances are introduced only when they are actually needed, and are automatically taken out when the demand ceases.

Program Cylinder

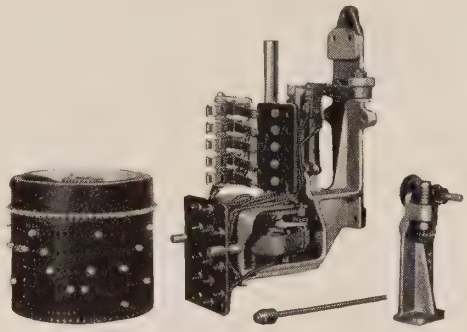


Fig. 3
Program Cylinder
Exploded View

It is a well-known fact that each intersection develops characteristic peaks, which may or may not be repeated from day to day. Monday's traffic may be characteristic of Tuesday's and Wednesday's, or it may be radically different. Saturday, Sunday and holiday traffic differs greatly from business day traffic. A week's survey of any intersection will clearly show the hills and valleys in the traffic flow curves. These hills and valleys, translated into vehicles per hour, form the basis for setting the week's program. Once the program of increased time is determined, it is set up on the program cylinder and the Traffic Flow Regulator automatically extends the time during the hours when it is needed. The program cylinder retains these settings until the character of the intersection changes. It is necessary to change the program only when some physical change occurs at or near the intersection, such as the opening or closing of a nearby street, or when there is some seasonable change in traffic, due to the opening or closing of suburban resorts.

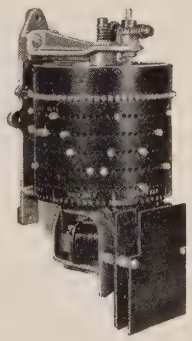


Fig. 4
Program Cylinder

CROUSE-HINDS

Type TFR Traffic Flow Regulator

Period of Operation

The Traffic Flow Regulator will start the signals and shut them down at any desired time. On week days they may be started at 6:30 or 7:00 A. M., and on Sundays and holidays at 9:00 A. M. or later. Similarly they may be shut down at any desired hour. Either or both "GO" periods may be extended at will and special movements for pedestrians and turning traffic may be introduced when necessary. Signals may be shut down completely or flashed after midnight, or they may be operated all night on the short cycle.

Regular Two-Street Intersection

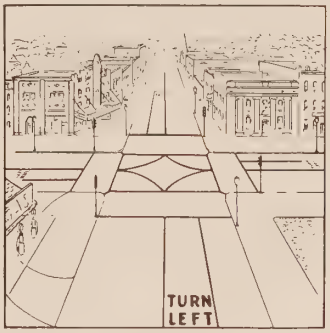


Fig. 1

Proper pavement markings will assist in aligning traffic for through and turning movements. Pedestrian crosswalks should be clearly shown, also the centerline of the roadway. On four and six-lane streets the several lanes should be designated and marked for the proper traffic movements. Proper markings facilitate the turning movements, permitting two left turns to be made simultaneously inside of the pivot.

Morning Rush-Hour

Fig. 2

The morning rush-hour usually brings heavy traffic to one street or the other, sometimes to both streets, and lasts about an hour. The Traffic Flow Regulator will add the necessary amount of time to either or both streets to handle this increased traffic, thus greatly decreasing the number of stops and consequently increasing the efficiency of the intersection.

Morning Off-Peak Hour

Fig. 3

After the rush hour is over, traffic usually returns to normal level. Often, during the off-peak hours, the street which carried little rush-hour traffic carries the principal off-peak traffic. Under such conditions the Traffic Flow Regulator will restore normal short cycle timing to one street and add time to the "GO" period of the street carrying the most traffic.

Noon-Hour

Fig. 4

During the noon hour there is usually an increase of traffic on both streets, caused by people going home to lunch or downtown to the hotels, restaurants, and stores. This traffic is not directional, but shows up on both streets. The Traffic Flow Regulator will add the necessary amount of time to the "GO" period of both streets, handling the increased traffic with safety and without any annoying delay.

CROUSE-HINDS

Type TFR Traffic Flow Regulator

Afternoon Off-Peak Hour

Fig. 5

The afternoon off-peak hour is much the same as the morning off-peak hour, except that it is often complicated by merchandise deliveries and some pleasure driving, particularly in the summertime when beach resorts and country clubs are open. Here again the Traffic Flow Regulator solves the problem and allots the proper amount of increased time to each street in proportion to the actual traffic demand.

Evening Pleasure Driving

Fig. 7

Evening is the time for pleasure, for visiting friends, for going to suburban resorts, or simply driving aimlessly about. Traffic usually follows the principal traffic arteries where signals are installed. Delays are avoided by the Traffic Flow Regulator, since it may be set to handle this pleasure traffic, either by returning the timer to the normal short cycle or adding the necessary time to the "GO" period of one street or the other.

Afternoon Rush-Hour

Fig. 6

This time of day places the greatest demand upon any traffic signal system. The ordinary timer, if set for this demand, is inefficient during the other hours of the day; and, if set for off-peak traffic will not handle the heavy rush-hour traffic. The Traffic Flow Regulator immediately assumes this extra load and increases the time for each traffic movement and may also provide for a heavy left turn, if necessary.

School Traffic

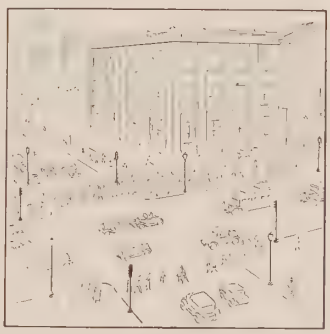


Fig. 8

The safety of school children presents a problem to any city administration, since schools are usually on important traffic arteries. The ordinary traffic signal timer is not set for them, but is set for vehicular traffic. The Traffic Flow Regulator may be set to allow children sufficient time to cross the street in safety, or stop all vehicular traffic for a predetermined time once each cycle when children are going to and leaving school.

CROUSE-HINDS

Type TFR Traffic Flow Regulator

Church Traffic

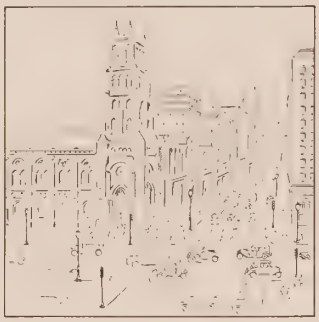


Fig. 1

On Sundays, traffic around churches places an extra demand on the signals. People come to church in cars and park them nearby. When church is over, people leave in great crowds. The Traffic Flow Regulator will allot the proper amount of time to each street or introduce a special pedestrian interval, stopping all vehicular traffic once each cycle to permit pedestrians to cross to their parked cars.

Out-of-Town Traffic

Fig. 3

On Saturday afternoons, Sundays, and holidays, out-of-town traffic places a great demand upon traffic signal timers, since the volume increases and often the direction. Streets of little importance during business days become extremely busy on weekends. This out-of-town traffic is particularly heavy in the summertime. The Traffic Flow Regulator handles this increased traffic perfectly, allowing increased time to the movements affected at the time the heavy traffic occurs.

Factory Traffic

Fig. 2

When a large factory closes for the day, everyone is in a hurry to get home and cars leave the factory yard as rapidly as possible. A poorly-timed signal simply congests traffic at the intersection and delays the movement out of the yard. The Traffic Flow Regulator will add the necessary amount of time to the street carrying the heavy traffic, thus permitting the cars to leave the yard in the shortest possible time.

Left Turn

Fig. 4

At most intersections the left turn becomes a difficult problem at times. During light traffic hours it can be handled safely by the ordinary traffic signal timer. However, during peak traffic, it often becomes so heavy that it seriously impedes other traffic. The Traffic Flow Regulator will insert a special period for the left turn, when and as long as it is needed, and return to the normal timing when the need has passed.

CROUSE-HINDS

Type TFR Traffic Flow Regulator

Pedestrian Traffic

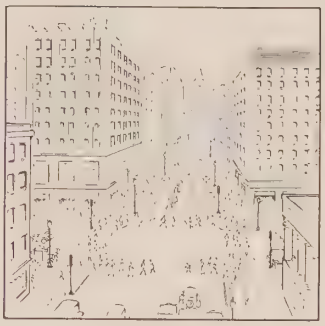


Fig. 5

Heavy pedestrian traffic has always been a problem for traffic engineers. At certain times a special pedestrian period is badly needed in the regular traffic cycle. Engineers have been loathe to put it in, since it seriously delays vehicular traffic when there is no great volume of pedestrian traffic. The Traffic Flow Regulator will provide a special pedestrian period once each traffic cycle, when it is necessary and remove it when the need has passed.

The Odd Street

Fig. 6

What to do with the fifth street of an otherwise regular intersection is a problem which has no simple solution. To allot special time to it throughout the day unduly penalizes traffic on the other streets. The Traffic Flow Regulator solves the problem by providing a special period for the odd street during the rush-hours when it is necessary, and combines it with another street during the off-peak hours.

Increases Street Efficiency

The Traffic Flow Regulator will greatly increase the all-day efficiency of any intersection, since it will pass traffic when, and as long as, there is any demand upon it. During light traffic hours it will provide a short cycle and a consequent rapid turn-over with a minimum of annoying and useless delay. During peak-hours it will increase the time allotted to any or all traffic movements, as long as the peak lasts, and will provide for left turns and pedestrians when necessary. It may be adjusted to the continually changing traffic flow, and efficient traffic movement is easily provided for any intersection no matter how complicated it may be.

CROUSE-HINDS

Type TFR Traffic Flow Regulator•

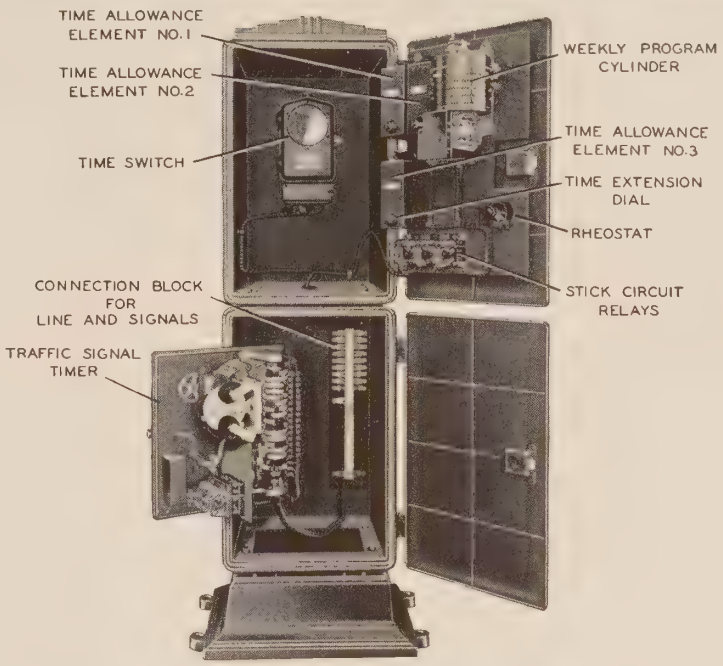


Fig. 1•
Type TFR-2 Traffic Flow Regulator
With Doors Open showing Parts

Above is shown an illustration of the Traffic Flow Regulator in its complete form for handling traffic that varies greatly from day to day. In the bottom cabinet, there is an automatic variable traffic signal timer, and a terminal block for all field connections. In the top cabinet, securely fastened on the rear wall, there is a time switch on which the hours of the various daily traffic periods are set. On the door panel are mounted the program cylinder, time allowance elements, relays, etc.

As shown here, the Traffic Flow Regulator will handle the most complicated intersection whether regular or irregular. Two of the time allowance elements may be used for increasing the "GO" interval on two streets; the third one, for handling left turns or an odd street; and a fourth one (not shown), for introducing a special pedestrian period. By means of the program cylinder these special traffic movements and increased time allowances may be used when necessary and removed when the need has passed.

At a simple intersection where it is only necessary to add time to the two "GO" intervals during certain definite times of the day, every day in the week—for example, during the morning and afternoon rush-hours—the weekly program cylinder is not necessary, and only two time allowance elements are required. In this form the Traffic Flow Regulator consists of a time switch and two time allowance elements only, and may be used with any type or make of timer already installed, simply by making the proper connections between it and the timer. It is unnecessary to dig up the streets, and the connections between signals and controller need not be disturbed at all.

The entire Traffic Flow Regulator is wired complete, ready for operation. The cabinet is equipped with its own ornamental pedestal, for bolting to a concrete foundation.

Simplicity of Operation: The Traffic Flow Regulator is easy to install and operate. Connections to signals and power feed are the same as with an ordinary timer. All wiring between timer, program cylinder, time allowance elements, and connection block are made at the factory. It is only necessary to connect signal wires and power line to the connection block.

When the traffic periods have been established and set up on the time switch, the program cylinder is set in accordance with the traffic flow curves. If time is to be added to any traffic movement, a pin is inserted in the proper hole in the program cylinder and the time allowance is added to that particular movement once each time-cycle for the duration of the traffic period. Suitable charts which show the developments of the weekly program cylinder are provided with each Traffic Flow Regulator, and after the program has been decided upon and marked on the chart, only a few minutes are required to set up the weekly program cylinder. If no time is to be added to the movement, the pin is not used and the signals operate on the normal short time-cycle. The amount of time to be added to each traffic movement is controlled by setting the dial on the corresponding time allowance element.

•Denotes revision and change in illustration.

CROUSE-HINDS

Type TFR-2 Traffic Flow Regulator•

Variable Speed—40 to 300 Seconds Total Period‡

115-Volt, 60 Cycle A. C.★

In Cast Aluminum, Weatherproof Cabinet with Lock—Wired Complete

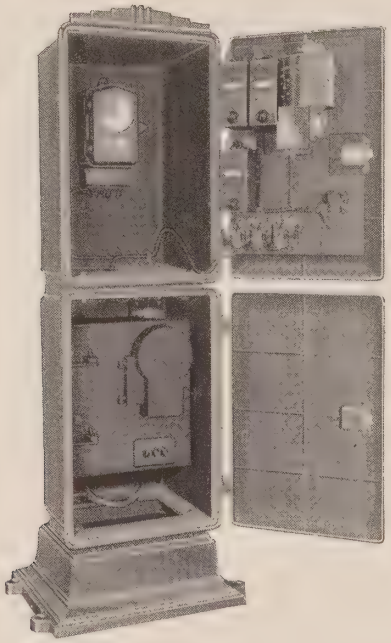


Fig. 1
Type TFR-2 Traffic Flow Regulator

Type	Number of Vehicle Movements	Minimum Number of Signal Circuits	Number of Time Extensions	Cat. No.	List, each†
TFR-2 Traffic Flow Regulator	2	6	1	46433	$630.00
	2	6	2	46434	680.00
	3	9	3	46435	742.00
	4	12	4	46436	804.00
	5	15	4	46437	816.00

Extra Equipment

Number of Vehicle Movements	Two	Three	Four	Five
Description	Add to List Prices of Controllers			
Off-Duty Flashing	$18.00*	$30.00*	$30.00*	$42.00*
Emergency All-Red	12.00	24.00	24.00	36.00
Radio Interference Filter for Flashing Circuit Only	$ 8.00			
Auxiliary Manual Switch and Cord	7.00			
Each Additional Circuit	4.00			
Each Additional Time Allowance Element	50.00			

★For 25, 40, or 50 cycles, add $10.00 to the list prices.
*Prices include flasher and necessary jack-mounted relays.
†Prices include ground pedestal. For steel or wood-pole mounting, deduct $8.00 from the list prices.
‡If specified on the order, can be furnished for other total periods.
Dimensions, section 613.
•Denotes revision.

CROUSE-HINDS

Type TFR Traffic Flow Regulator

Special Uses

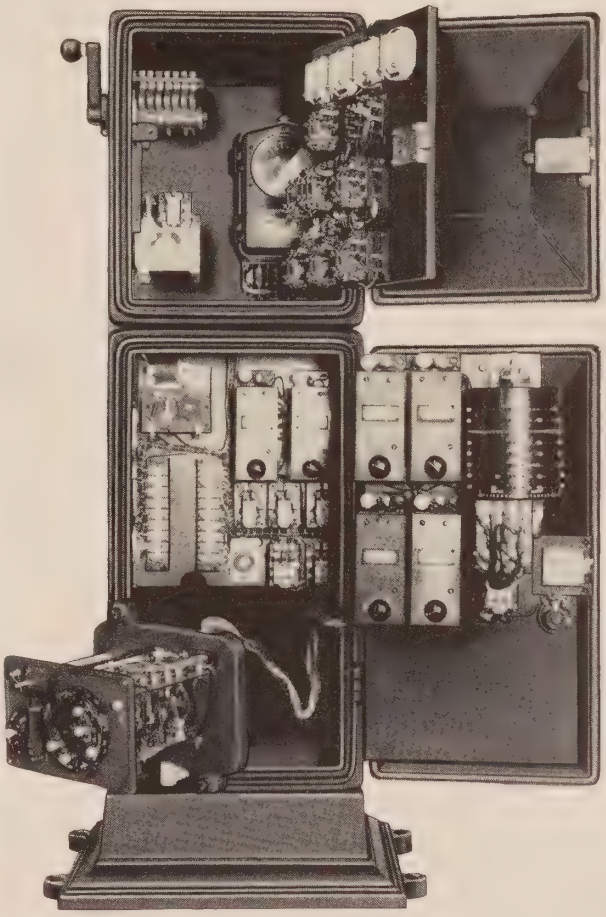


Fig. 1
Special Type TFR for Three-Street Operation
Equipped with Special Program Cylinder
and Six Time Allowance Elements

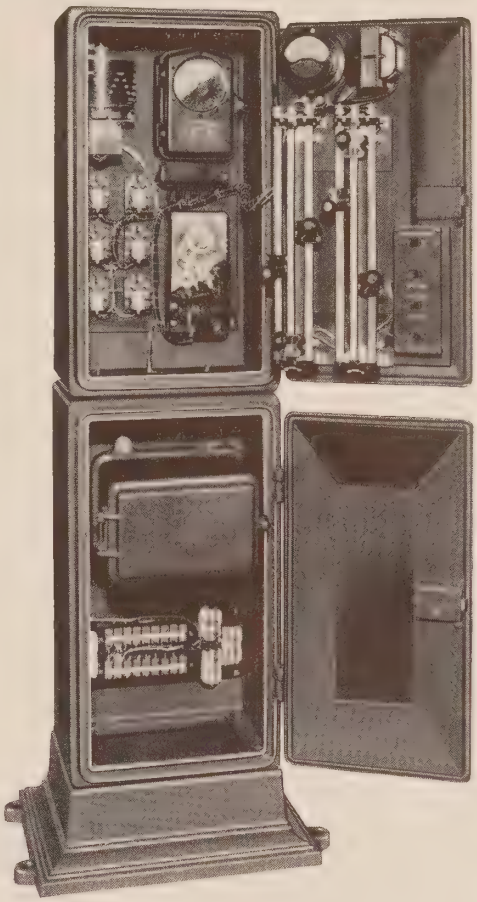


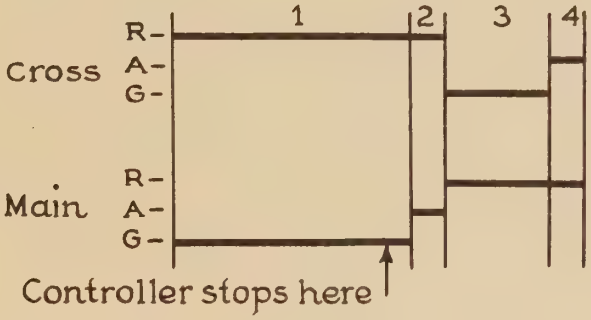
Fig. 2
Special Type DFM-21 "Trafflex" Master
Equipped with TFR Program Cylinder
to Give Four Different Total Periods
at Predetermined Intervals

The use of the Traffic Flow Regulator is not limited to the uses enumerated on the preceding pages, but it may be used to advantage where special problems arise at extremely complicated traffic intersections. Illustrated above are two special controls built by the Crouse-Hinds Company. There is no limit to the flexibility and usefulness of these controls. Obviously it is not possible to list these special controls, because no two of them are ever exactly alike. However, Crouse-Hinds engineers will gladly cooperate with city traffic engineers in determining the proper solution of these special applications. Such requests should be accompanied by a scale drawing, showing the separate traffic movements, together with a statement of the results to be desired in the way of segregating the conflicting lanes of traffic.

Fig. 3
Installation of Crouse-Hinds Traffic Signals

Fig. 4
Installation of Crouse-Hinds Traffic Signals

TYPE PA-11 PEDESTRIAN ACTUATED CONTROLLER
WITH GEAR SHIFT--ADJUSTABLE TIME-CYCLE--40, 50, 60, 70, and 80 SECONDS†
COMPLETE JACK MOUNTED CONTROLLERS IN SIZE 16 WEATHERPROOF CABINET
10-Ampere, 115-Volt, 60-Cycle A. C.*



Use

PA-11 pedestrian actuated controller used primarily in mid-block locations in front of industrial plants, schools, and other places of assembly where it is necessary for large volumes of pedestrian traffic to cross an important highway.

Design

PA-11 pedestrian actuated controller is a standard Crouse-Hinds controller modified for pedestrian actuation. It employs the same timing motor, cam-unit and dial-assembly. It is designed to operate with three-color signals and will give any standard four or six-interval sequence, as well as special interval sequences. The time-cycle is adjustable from 30 to 120 seconds, and when shipped from the factory is equipped with five time-cycle gears - 40, 50, 60, 70, and 80 seconds.

The controller has a memory circuit which makes actuation effective during intervals 1 and 4.

On the face-plate of the controller there is a switch marked "Pedestrian-Pretimed" and when this switch is thrown to the "Pretimed" position it will operate as a standard pretimed controller.

Normal Interval-Sequence

Steady GREEN to the highway and steady RED to the crosswalk with controller coming to rest at the end of interval 1.

Actuated Interval-Sequence

Upon actuation the controller runs through the following sequence:

Interval 2 -- Main highway clearance
Interval 3 -- Pedestrian interval: RED to highway and GREEN to crosswalk
Interval 4 -- Pedestrian clearance
Interval 1 -- Steady GREEN to highway and steady RED to crosswalk, stopping at end of interval 1

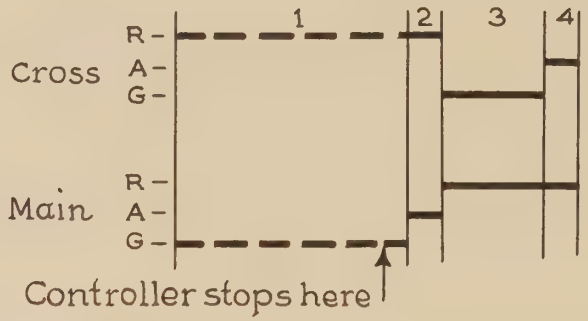
Other Pedestrian Indications

During interval 3 of the actuated sequence controller may be arranged to give (1) RED to main highway and RED-WALK to crosswalk or (2) RED-AMBER in all four directions.

Type	Description	Cat. No.	List, each
PA-11	Pedestrian Actuated Controllers	46781	$228.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.
Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.
*For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.
†These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.
Extra Equipment, section 603, page 14.
Instructions for ordering, section 607, page 11.
Dimensions, section 613.

TYPE PA-12 PEDESTRIAN ACTUATED CONTROLLER
WITH GEAR SHIFT--ADJUSTABLE TIME-CYCLE--40, 50, 60, 70, and 80 SECONDS‡
COMPLETE JACK MOUNTED CONTROLLERS IN SIZE 22 WEATHERPROOF CABINET
10-Ampere, 115-Volt, 60-Cycle A. C.*



Use

PA-12 pedestrian actuated controller used at intersections or in mid-block locations adjacent to industrial plants, schools, and other places of assembly where it is necessary for large volumes of pedestrian traffic to cross an important highway.

Design

PA-12 pedestrian actuated controller is a standard Crouse-Hinds controller modified for pedestrian actuation. It employs the same timing motor, cam-unit and dial-assembly. It is designed to operate with three-color signals and will give any standard four or six-interval sequence, as well as special interval sequences. The time-cycle is adjustable from 30 to 120 seconds, and when shipped from the factory is equipped with five time-cycle gears - 40, 50, 60, 70, and 80 seconds. Type PA-12 controller is equipped with a radio interference filter.

The controller has a memory circuit which makes actuation effective during intervals 1 and 4.

On the face-plate of the controller there is a switch marked "Pedestrian-Pretimed" and when this switch is thrown to the "Pretimed" position it will operate as a standard pretimed controller.

Normal Interval-Sequence

Flashing GREEN to the highway and flashing RED to the crosswalk with controller coming to rest at the end of interval 1.

Actuated Interval-Sequence

Upon actuation the controller runs through the following sequence:

Interval 2 -- Main highway clearance
Interval 3 -- Pedestrian interval: steady RED to highway and steady GREEN to crosswalk
Interval 4 -- Pedestrian clearance
Interval 1 -- Flashing GREEN to highway and flashing RED to crosswalk, stopping at end of interval 1

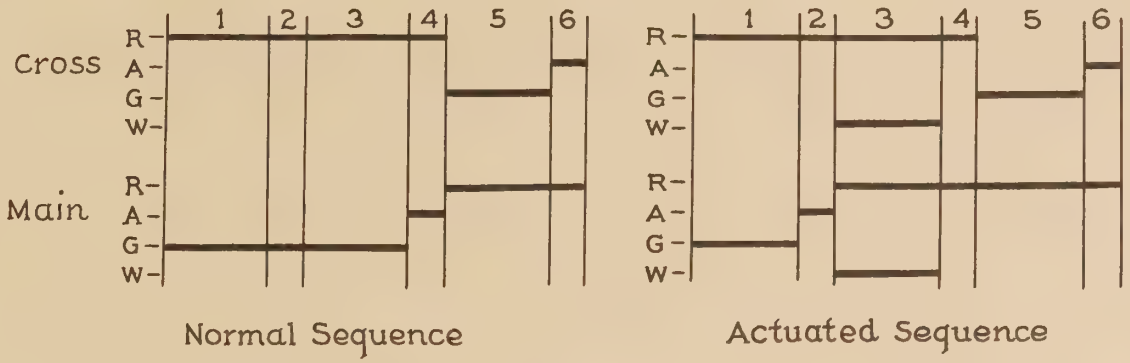
Other Pedestrian Indications

During interval 3 of the actuated sequence controller may be arranged to give (1) RED to main highway and RED-WALK to crosswalk or (2) RED-AMBER or RED-WALK in all four directions.

Type	Description	Cat. No.	List, each
PA-12	Pedestrian Actuated Controller	46782	$261.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.
Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.
*For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.
‡These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.
Extra Equipment, section 603, page 14.
Instructions for ordering, section 607, page 11.
Dimensions, section 613

TYPE PA-13 PEDESTRIAN ACTUATED CONTROLLER
WITH GEAR SHIFT--ADJUSTABLE TIME-CYCLE--40, 50, 60, 70, and 80 SECONDS‡
COMPLETE JACK MOUNTED CONTROLLERS IN SIZE 22 WEATHERPROOF CABINET
10-Ampere, 115-Volt, 60-Cycle A. C.*



Use

PA-13 pedestrian actuated controller is designed for use at intersections adjacent to industrial plants, schools and other places of assembly where pedestrian traffic is extremely heavy at certain times of the day and where turning vehicles preclude the safe passage of pedestrians with the green light. The controller is driven by a synchronous motor and it may be used in a non-interconnected or an interconnected system.

Design

PA-13 pedestrian actuated controller is a standard Crouse-Hinds synchronous controller modified for pedestrian actuation. It is designed to operate with three-color signals and will give any standard four or six-interval sequence, as well as special interval sequences. The time cycle is adjustable from 30 to 120 seconds, and when shipped from the factory is equipped with five time-cycle gears - 40, 50, 60, 70, and 80 seconds.

The time allotted to the pedestrian interval of the actuated sequence is taken from the last part of the main highway green interval, under which the offset of the beginning of the green remains constant for both the normal and actuated sequences. Should the time-space graph show that better results could be obtained with with the pedestrian interval being taken from the first part of the main highway green, the controller will be so designed. In ordering specify which sequence is desired.

The controller has a memory circuit which makes actuation effective during intervals 1, 2, 4, 5, and 6.

On the face-plate of the controller there is a switch marked "Pedestrian-Pretimed" and when this switch is thrown to the "Pretimed" position it will operate as a standard pretimed controller.

Normal Interval-Sequence

Under normal conditions without any pedestrian actuation, the PA-13 controller operates as a regular pretimed controller alternating the right-of-way between the two highways.

Actuated Interval-Sequence

Upon actuation the memory circuit is energized but the controller continues on the normal sequence until it reaches the end of interval 1 and then it runs through the actuated sequence:

Interval 2 -- Main highway clearance
Interval 3 -- Pedestrian interval - RED and WALK in all four directions
Interval 4 -- Pedestrian clearance - RED in all four directions
Interval 5 -- RED to main highway and GREEN to cross highway
Interval 6 -- Cross highway clearance
Interval 1 -- Return to normal sequence

Other Pedestrian Indication

During interval 3 of the actuated sequence the controller may be arranged to give RED-AMBER or RED-WALK in all four directions. In ordering specify the interval sequence desired.

Type	Description	Cat. No.	List, each
PA-13	Pedestrian Actuated Controller	46783	$268.00

If cabinet is not desired, deduct $25.00 from the list price of the complete controller.

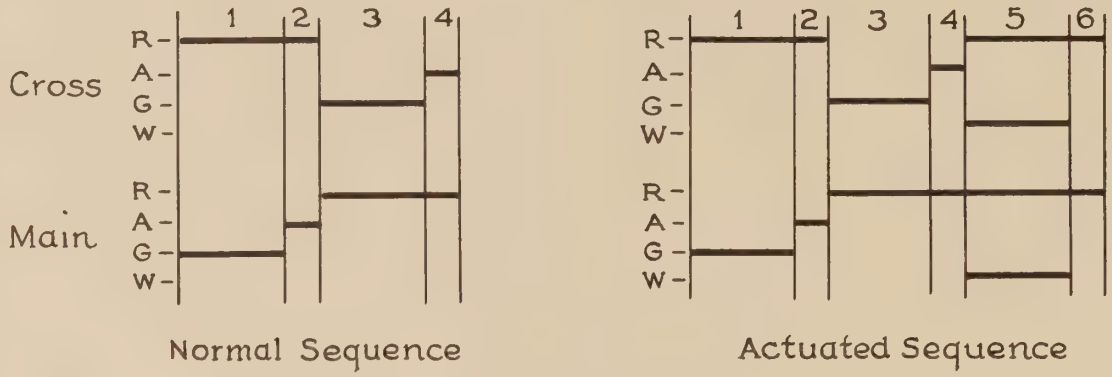
Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

*For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.

‡These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.

Extra Equipment, section 603, page 14.
Instructions for ordering, section 607, page 11.
Dimensions, section 613.

TYPE PA-14 PEDESTRIAN ACTUATED CONTROLLER
WITH GEAR SHIFT--ADJUSTABLE TIME-CYCLE--40, 50, 60, 70, and 80 SECONDS‡
COMPLETE JACK MOUNTED CONTROLLERS IN SIZE 22 WEATHERPROOF CABINETS
10-Ampere, 115-Volt, 60-Cycle A. C.*



Normal Sequence

Actuated Sequence

Use

PA-14 pedestrian actuated controller is designed for use at intersections adjacent to industrial plants, schools and other places of assembly where pedestrian traffic is extremely heavy at certain times of the day and where turning vehicles preclude the safe passage of pedestrians with the green light.

Design

PA-14 pedestrian actuated controller is a standard Crouse-Hinds controller modified for pedestrian actuation. It is designed to operate with three-color signals and will give any standard four or six-interval sequence, as well as special interval sequences. The time cycle is adjustable and when shipped from the factory is equipped with five time-cycle gears - 40, 50, 60, 70, and 80 seconds.

The time allotted to pedestrian interval of the actuated sequence is added to the time-cycle following the cross highway change interval.

The controller has a memory circuit which makes actuation effective during intervals 1, 2, 3, 4, and 6.

On the face-plate of the controller there is a switch marked "Pedestrian-Pretimed" and when this switch is thrown to the "Pretimed" position it will operate as a standard pretimed controller.

Normal Interval-Sequence

Under normal conditions without any pedestrian actuation, the PA-14 controller operates as a regular pretimed controller alternating the right-of-way between the two highways.

Actuated Interval-Sequence

Upon actuation the memory circuit is energized but the controller continues on the normal sequence until it reaches the end of interval 4 and then it runs through the pedestrian intervals as follows:

Interval 5 -- Pedestrian interval - RED and WALK in all four directions
Interval 6 - Pedestrian clearance - RED in all four directions
Interval 1 - Return to normal sequence

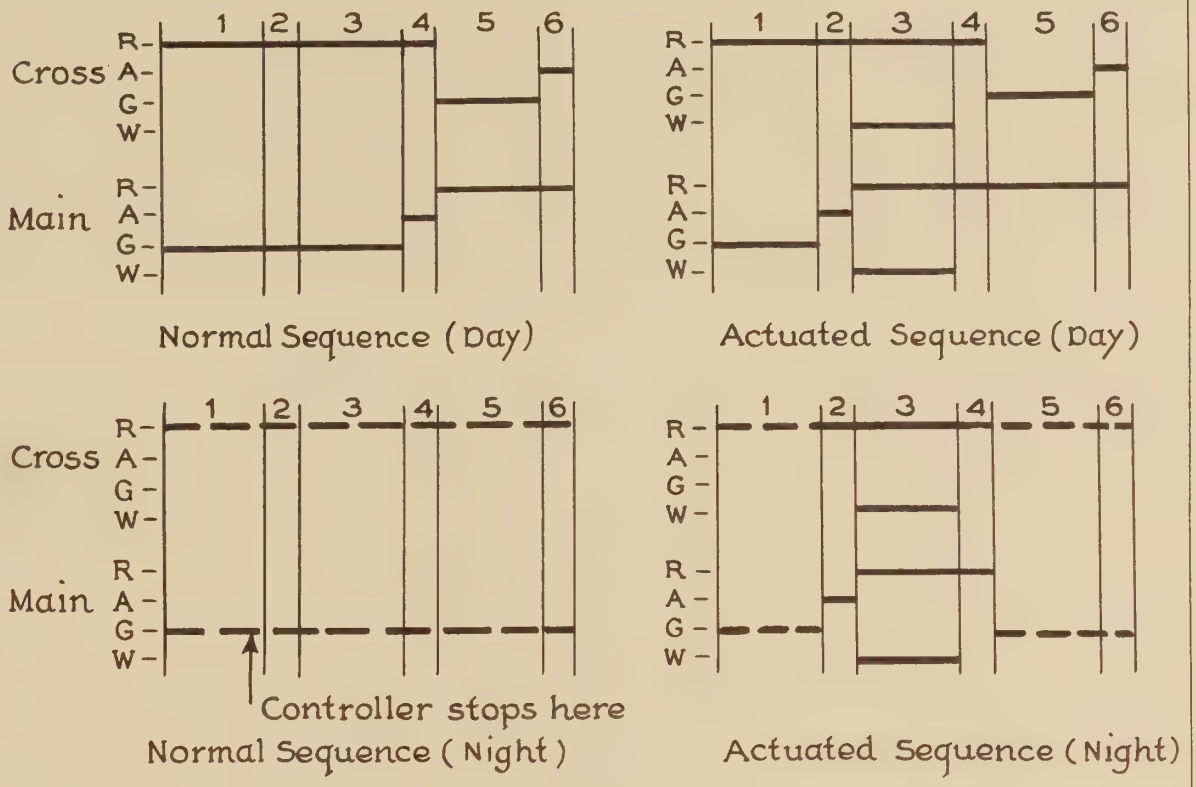
Other Pedestrian Indication

During interval 5 of the actuated sequence the controller may be arranged to give RED and AMBER in all four directions. In ordering specify the sequence desired.

Type	Description	Cat. No.	List, each
PA-14	Pedestrian Actuated Controller	46784	$315.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.
Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $2.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.
*For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.
‡These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.
Extra Equipment, section 603, page 14.
Instructions for ordering, section 607, page 11.
Dimensions, section 613.

TYPE PA-15 PEDESTRIAN ACTUATED CONTROLLER
WITH GEAR SHIFT--ADJUSTABLE TIME-CYCLE--40, 50, 60, 70, and 80 SECONDS‡
COMPLETE JACK MOUNTED CONTROLLERS IN SIZE 28 WEATHERPROOF CABINET
10-Ampere, 115-Volt, 60-Cycle A. C.*



Use

PA-15 pedestrian actuated controller is designed for use at intersections adjacent to industrial plants, schools and other places of assembly where pedestrian traffic is extremely heavy at certain times of the day and where turning vehicles preclude the safe passage of pedestrians with the green light. It is for use particularly at those intersections at which the vehicle volume at night (or during portions of the day) may fall to a point where control by flashing is sufficient but at which protection to pedestrians is required by actuation.

Design

PA-15 pedestrian actuated controller is a standard Crouse-Hinds controller modified for pedestrian actuation. It is designed to operate with three-color signals and will give any standard four or six-interval sequence, as well as special interval sequences. The time cycle is adjustable from 30 to 120 seconds and when shipped from the factory is equipped with five time-cycle gears - 40, 50, 60, 70, and 80 seconds. Type PA-15 controller is equipped with a radio interference filter.

The time allotted to the pedestrian interval of the actuated sequence is taken from the last part of the main highway green interval. If desired the pedestrian interval may be taken from the first part of the main highway green. In ordering, specify which sequence is desired.

The controller has a memory circuit which makes actuation effective during intervals 1, 2, 4, 5, and 6.

On the face-plate of the controller there is a switch marked "Pedestrian-Pretimed" and when this switch is thrown to the "Pretimed" position it will operate as a standard pretimed controller.

PA-15 Controller is a combination of PA-12 and PA-13; operating as PA-13 during the day and as PA-12 at night.

The controller is changed from day to night operation by a time switch which provides for three complete changes per day, and which has an omitting device.

Normal Interval-Sequence (Day Operation)

Under normal conditions without any pedestrian actuation, the PA-15 controller operates as a regular pretimed controller alternating the right-of-way between the two highways.

Actuated Interval-Sequence (Day Operation)

Upon actuation the memory circuit is energized but the controller continues on the normal sequence until it reaches the end of interval 1 and then it runs through the actuated sequences:

Interval 2 -- Main highway clearance
Interval 3 -- Pedestrian interval - RED and WALK in all four directions
Interval 4 -- Pedestrian clearance - RED in all four directions
Interval 5 -- RED to main highway and GREEN to cross highway
Interval 6 -- Cross highway clearance
Interval 1 -- Return to normal sequence

Normal Interval-Sequence (Night Operation)

The normal interval sequence at night is FLASHING GREEN to the main highway and FLASHING RED to the cross highway, with the controller at rest at the end of interval 1.

Actuated Interval-Sequence (Night Operation)

Upon actuation the controller runs through the following actuated sequence:

Interval 2 -- Clearance interval - AMBER to main highway and RED to cross highway
Interval 3 -- Pedestrian interval - RED and WALK in all directions
Interval 4 -- Pedestrian clearance - RED in all directions
Intervals 5, 6, and 1 -- Flashing, with controller coming to rest at end of interval 1

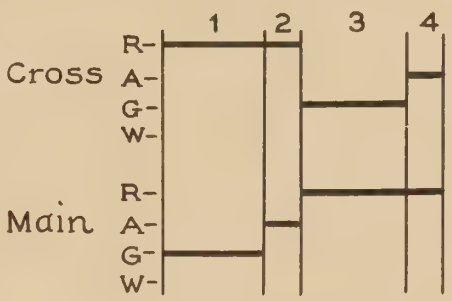
Other Pedestrian Indication

During interval 3 of the actuated sequence the controller may be arranged to give RED and AMBER in all four directions.

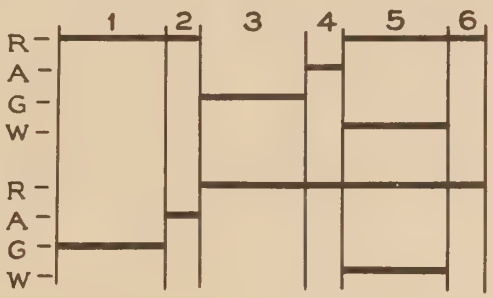
Type	Description	Cat. No.	List, each
PA-15	Pedestrian Actuated Controller	46785	$394.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.
Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.
*For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.
†These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.
Extra Equipment, section 603, page 14.
Instructions for ordering, section 607, page 11.
Dimensions, section 613.

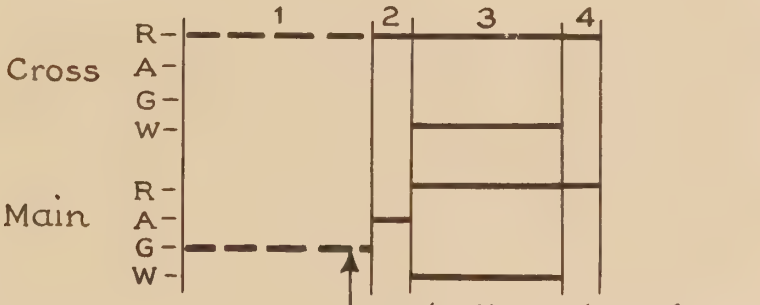
TYPE PA-16 PEDESTRIAN ACTUATED CONTROLLER
WITH GEAR SHIFT--ADJUSTABLE TIME-CYCLE--40, 50, 60, 70, and 80 SECONDS‡
COMPLETE JACK MOUNTED CONTROLLERS IN SIZE 28 WEATHERPROOF CABINET
10-Ampere, 115-Volt, 60-Cycle A. C.*



Normal Sequence (Day)



Actuated Sequence (Day)



Night operation

Use

PA-16 pedestrian actuated controller is designed for use at intersections adjacent to industrial plants, schools and other places of assembly where pedestrian traffic is extremely heavy at certain times of the day and where turning vehicles preclude the safe passage of pedestrians with the green light. It is for use particularly at those intersections at which the vehicle volume at night (or during portions of the day) may fall to a point where control by flashing is sufficient but at which protection to pedestrians is required by actuation.

Design

PA-16 pedestrian actuated controller is a standard Crouse-Hinds controller modified for pedestrian actuation. It is designed to operate with three-color signals and will give any standard four or six-interval sequence, as well as special interval sequences. The time cycle is adjustable from 30 to 120 seconds and when shipped from the factory is equipped with five time-cycle gears - 40, 50, 60, 70, and 80 seconds. Type PA-16 controller is equipped with a radio interference filter.

The pedestrian interval is added to the cycle at the end of the cross highway change interval and the time allotted to the pedestrian interval of the actuated sequence is added to the time cycle of the normal sequence.

The controller has a memory circuit which makes actuation effective during intervals 1, 2, 3, and 4.

On the face-plate of the controller there is a switch marked "Pedestrian-Pretimed" and when this switch is thrown to the "Pretimed" position it will operate as a standard pretimed controller.

PA-16 controller is a combination of PA-12 and PA-14; operating as a PA-14 in the daytime and as a PA-12 at night.

The controller is changed from day to night operation by a time switch which provides for three complete changes per day, and which has an omitting device.

Normal Interval-Sequence (Day Operation)

Under normal conditions without any pedestrian actuation, the PA-16 controller operates as a regular pretimed controller alternating the right-of-way between the two highways.

Actuated Interval-Sequence (Day Operation)

Upon actuation the memory circuit is energized but the controller continues on the normal sequence until it reaches the end of interval 4 and then it runs through the actuated sequence:

Interval 5 -- Pedestrian interval - RED and WALK in all four directions
Interval 6 -- Pedestrian clearance - RED in all four directions
Interval 1 -- Return to normal sequence

Normal Interval-Sequence (Night Operation)

The normal interval sequence at night is FLASHING GREEN to the main highway and FLASHING RED to the cross highway, with the controller at rest at the end of interval 1.

Actuated Interval-Sequence (Night Operation)

Upon actuation the controller runs through the following actuated sequence:

Interval 2 -- Clearance interval - AMBER to main highway and RED to cross highway
Interval 3 -- Pedestrian interval - RED and WALK in all directions
Interval 4 -- Pedestrian clearance - RED in all four directions
Interval 1 -- Flashing, with controller coming to rest at end of interval 1

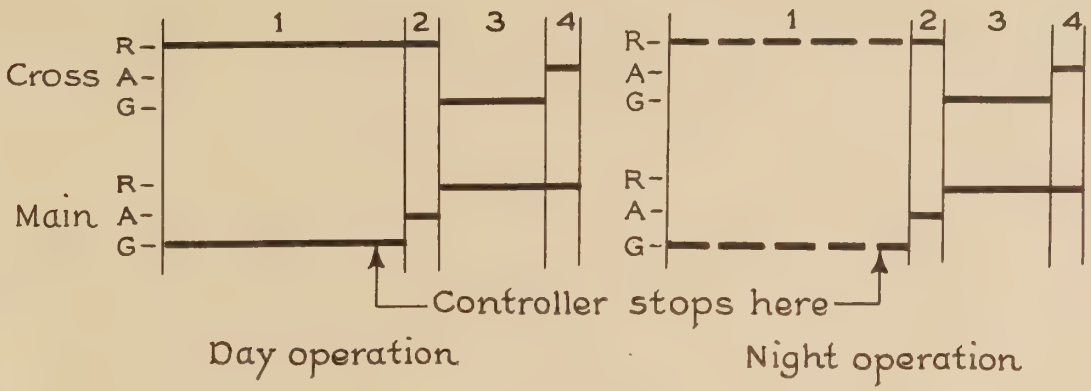
Other Pedestrian Indication

During interval 5 of the actuated sequence the controller may be arranged to give RED and AMBER in all four directions.

Type	Description	Cat. No.	List, each
PA-16	Pedestrian Actuated Controller	46786	$418.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.
Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.
*For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.
†These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.
Extra Equipment, section 603, page 14.
Instructions for ordering, section 607, page 11.
Dimensions, section 613.

TYPE PA-17 PEDESTRIAN ACTUATED CONTROLLER
WITH GEAR SHIFT--ADJUSTABLE TIME-CYCLE--40, 50, 60, 70, and 80 SECONDS‡
COMPLETE JACK MOUNTED CONTROLLERS IN SIZE 22 WEATHERPROOF CABINET
10-Ampere, 115-Volt, 60-Cycle A. C.*



Use

PA-17 pedestrian actuated controller used primarily in mid-block locations in front of industrial plants, schools, and other places of assembly where it is necessary for large volumes of pedestrian traffic to cross an important highway.

Design

PA-17 pedestrian actuated controller is a standard Crouse-Hinds controller modified for pedestrian actuation. It employs the same timing motor, cam-unit and dial-assembly. It is designed to operate with three-color signals and will give any standard four or six-interval sequence, as well as special interval sequences. The time cycle is adjustable from 30 to 120 seconds, and when shipped from the factory is equipped with five time-cycle gears - 40, 50, 60, 70, and 80 seconds. Type PA-17 controller is equipped with a radio interference filter.

The controller has a memory circuit which makes actuation effective during intervals 1 and 4.

On the face-plate of the controller there is a switch marked "Pedestrian-Pretimed" and when this switch is thrown to the "Pretimed" position it will operate as a standard pretimed controller.

A PA-17 controller is a combination of PA-11 and PA-12; operating as a PA-11 in the daytime and as a PA-12 at night.

The controller is changed from day to night operation by a time switch which provides for three complete changes per day, and which has an omitting device.

Normal Interval-Sequence (Day Operation)

Steady GREEN to the highway and steady RED to the crosswalk with controller coming to rest at the end of interval 1.

Actuated Interval-Sequence (Day Operation)

Upon actuation the controller runs through the following sequence:

Interval 2 -- Main highway clearance
Interval 3 -- Pedestrian interval - steady RED to highway and steady GREEN to crosswalk
Interval 4 -- Pedestrian clearance
Interval 1 -- GREEN to highway and RED to crosswalk, stopping at end of interval 1

Normal Interval-Sequence (Night Operation)

Flashing GREEN to the highway and flashing RED to the crosswalk with controller coming to rest at the end of interval 1.

Actuated Interval-Sequence (Night Operation)

Upon actuation the controller runs through the following sequence:

Interval 2 -- Main highway clearance
Interval 3 -- Pedestrian interval: steady RED to highway and steady GREEN to crosswalk
Interval 4 -- Pedestrian clearance
Interval 1 -- Flashing GREEN to highway and flashing RED to crosswalk, stopping at end of interval 1

Other Pedestrian Indications

During interval 3 of the actuated sequence controller may be arranged to give (1) RED to main highway and RED-WALK to crosswalk or (2) RED-AMBER in all four directions.

Type	Description	Cat. No.	List, each
PA-17	Pedestrian Actuated Controller	46787	$295.00

If cabinet is not desired, deduct $25.00 from the list price of complete controller.

Prices include brackets for wood-pole mounting or adjustable pole bands for steel-pole mounting. Standard 4-inch pedestal adapter, $8.00 list, additional. Crouse-Hinds pedestal, Cat. No. 46391, 34 inches high, is listed in section 609, page 7.

*For 25, 40, and 50 cycles, add $10.00 to the list prices. For special voltages, consult the Main Office of the Crouse-Hinds Company, Syracuse 1, N. Y.

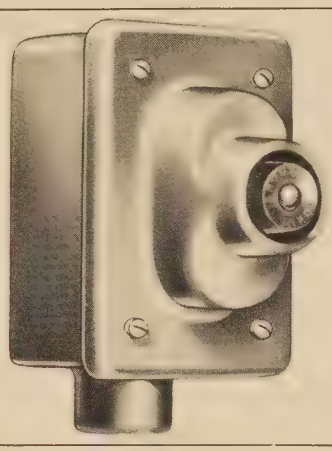
†These controllers may be furnished with gears for other time-cycles. See listing section 603, page 14.

Extra Equipment, section 603, page 14.

Instructions for ordering, section 607, page 11.

Dimensions, section 613.

TYPE PA PEDESTRIAN ACTUATED CONTROLLERS



Pedestrian Push Button

Description	Cat. No.	List, each
Pedestrian Push Button for 1/2" Conduit	10951-A	$10.00

Standard Equipment Furnished with Type PA Controllers

Description	PA-11	PA-12	PA-13	PA-14	PA-15	PA-16	PA-17
Five Time-Cycle Gears 40, 50, 60, 70, and 80 seconds	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hand-Operated Local Signal Shut-down Switch	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automatic to Manual Transfer Switch	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Identified Terminal Board for Field Connections	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fuse Cutout for Power Supply	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Amber-Red Flash Terminals	No	Yes	No	No	Yes	Yes	Yes
Flasher	No	Yes	No	No	Yes	Yes	Yes
Radio Interference Filter	No	Yes	No	No	Yes	Yes	Yes
"Pedestrian-Pretimed" Switch	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory Circuit	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Switch for Night Sequence	No	No	No	No	Yes	Yes	Yes

Instructions for Ordering

Since it is impossible to cover by catalog number all control variations, the following information is necessary before an order can be filled:

1. Color sequence. (If other than the one illustrated on listing pages.)
2. Voltage and frequency, if other than 115 volts, 60 cycles.
3. Time-cycle gears, if other than 40, 50, 60, 70, and 80 seconds.
4. Cabinet data.
   Wood-pole brackets, steel-pole bands, 4-inch pedestal adapter, or ground pedestal. State desired mounting.
   Top and bottom hub plates. State size and type. See section 608, page 13. If this information is not given in detail, cabinets will be furnished with YYP85S hub plate, tapped for 1 1/2-inch conduit on both top and bottom of cabinet..
5. Special drilling. Furnish drawing.
6. Paint. If other than Crouse-Hinds standard green, a color sample must be furnished.
7. Extra equipment. See listing in section 603, page 14.

CROUSE-HINDS

Lenses (Unlettered)•

For All Types of Signals

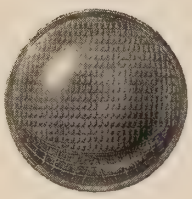


Fig. 1
Type T Combinaton Lens—Unlettered
Green, Amber, or Red

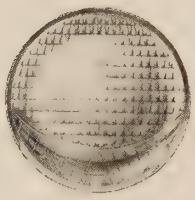


Fig. 2
Type B Combination Lens—Unlettered
Green, Amber, or Red

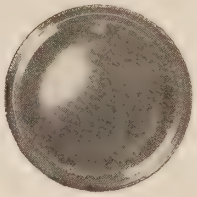


Fig. 3
Prismatic Diffusing Lens—Unlettered
Green, Amber, Red, or Clear

Optical System: Crouse-Hinds traffic signals, in common with others, use the standard 60-watt, 115-volt traffic signal lamp in an A-21 bulb. This lamp is especially suited to traffic signal work, since it is efficient and has a life of 2000 hours.

The light produced by this lamp is collected by the polished parabolic reflector behind it and projected in a narrow cone-shaped beam of light to the front lens. This narrow beam of light, produced by the reflector alone, would be useless for traffic signal work, since the resultant signal indication would be effective only over a small angle. The lens in turn distributes this light over the street so that traffic may be guided by it.

Lens Colors: Crouse-Hinds traffic signal lenses conform in transmission and chromaticity to the new Specifications of the Institute of Traffic Engineers. Each lens is tested and bears a label guaranteeing its quality.

Type T Combination Lens: The new type T combination lens, shown in Fig. 1 above, was designed to meet the candlepower distribution requirements of the new Specifications of the Institute of Traffic Engineers; and this lens, when used with the standard Crouse-Hinds parabolic glass traffic signal reflector not only meets, but also far exceeds the candlepower requirements of the Specifications. This lens has been thoroughly tested in accordance with NEMA-IES test procedure.

It provides a powerful, long-range signal indication and it also distributes light downward and to the sides, for pedestrians and nearby vehicle drivers, regardless of the angle from which it is seen. The type T combination lens is standard on all Crouse-Hinds signals and beacons.

Type B Combination Lens: The type B combination lens, shown in Fig. 2 above, was furnished as standard in all Crouse-Hinds traffic signals from 1927 to 1940, and is still very widely used. At some points it falls short of the I.T.E. candlepower requirements; but it is an excellent lens, and when the order so states it will be furnished instead of the type T lens at no extra cost.

Prismatic Diffusing Lens: The prismatic diffusing lens, shown in Fig. 3 above, was used on all Crouse-Hinds traffic signals from 1920 to 1927. This lens has a shorter range than either the type T or the type B lens, but gives a somewhat wider angle of light distribution. This lens may be substituted for the type T lens at no extra cost.

Description	Cat. No.	List, each
8⅜-Inch Type T Combination Lenses—Standard (Fig. 1) (Meets Specifications of Institute of Traffic Engineers)		
Type T Red Lens	KL3842	$2.00
Type T Amber Lens	KL3843	2.00
Type T Green Lens	KL3844	2.00
8⅜-Inch Type B Combination Lenses (Fig. 2)		
Type B Red Combination Lens	HL9310	$2.00
Type B Amber Combination Lens	HL9309	2.00
Type B Green Combination Lens	HL9311	2.00
8⅜-Inch Prismatic Diffusing Lenses (Fig. 3)		
Red Prismatic Diffusing Lens	HL8028	$2.00
Amber Prismatic Diffusing Lens	HL8029	2.00
Green Prismatic Diffusing Lens	HL8027	2.00
Clear Prismatic Diffusing Lens (For Base Floodlights Only)	HL8302	2.00

•Denotes revision.

CROUSE-HINDS

Lettered Lenses•

For All Types of Signals

Fig. 4
Prismatic Diffusing Lens
Green—Lettered "GO"

Fig. 5
Prismatic Diffusing Lens
Red—Lettered "STOP"

Fig. 6
Prismatic Diffusing Lens
Yellow—Lettered "CAUTION"

Fig. 7
Green Prismatic
Diffusing Lens
Broad Arrow

Fig. 8
Clear "WALK" Lens
I.T.E. Standard

Fig. 9
Clear "WAIT" Lens

Fig. 10
Green Prismatic
Diffusing Lens
I.T.E. Arrow

Fig. 11
Green Prismatic
Diffusing Lens
A.S.A. Arrow

Lettered Prismatic Diffusing Lenses: The lettered prismatic diffusing lens was formerly used as a standard in all Crouse-Hinds traffic signals. However, due to the wide use of traffic signals, the words "STOP," "CAUTION," and "GO" have become unnecessary. These lettered lenses will, however, be substituted for the standard combination lens at an advance of $1.00 per lens in the list prices.

Lenses with wording to meet special traffic conditions, such as "WAIT," "WALK," and the arrow lenses, are also listed below.

Fig. 8 illustrates the new "WALK" lens designed to meet the Specifications of the Institute of Traffic Engineers. The letters are 3 inches high and the width of the stroke is 3/32 of an inch. Fig. 9 shows a "WAIT" lens of similar design. Fig. 10 is a new arrow lens which meets the Specifications of I.T.E. The width of the stroke is considerably narrower than that of the old A.S.A. lens, with the result that the arrow shape of the new I.T.E. lens stands out clearly both day and night.

8⅜-Inch Lettered Prismatic Diffusing Lenses

Color	Inscription	Field	Lettering	Cat. No.	List, each•
Green	Lettered "GO" (Fig. 4)	Green	Black	HL8332	$3.00
Red	Lettered "STOP" (Fig. 5)	Red	Black	HL8331	3.00
Amber	Lettered "CAUTION" (Fig. 6)	Amber	Black	HL8330	3.00
Clear	Lettered "WALK" (Fig. 8)	Black	Clear	KL3825	3.00
Clear	Lettered "WAIT" (Fig. 9)	Black	Clear	KL3829	3.00
Green	Lettered "SIGA" ("GO" in Spanish)	Green	Black	HL4172	3.00
Red	Lettered "ALTO" ("STOP" in Spanish)	Red	Black	HL4173	3.00
Green	I.T.E. Arrow (Fig. 10)	Black	Clear	KL3185	3.00
Green	A.S.A. Arrow (Fig. 11)	Black	Green	KL491	3.00
Green	Broad Arrow (Fig. 7)	Black	Green	HL2296	3.00

•Denotes revision.

CROUSE-HINDS

Mast Arms

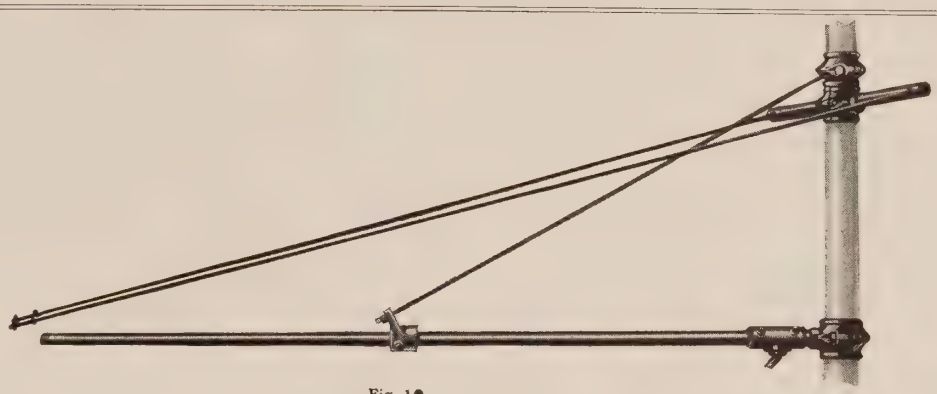


Fig. 1●
Mast Arm Complete with Guy-Rods and
Spreader Arm for Steel-Pole Mounting
Showing Sag Guy Used Only on Long Mast Arms

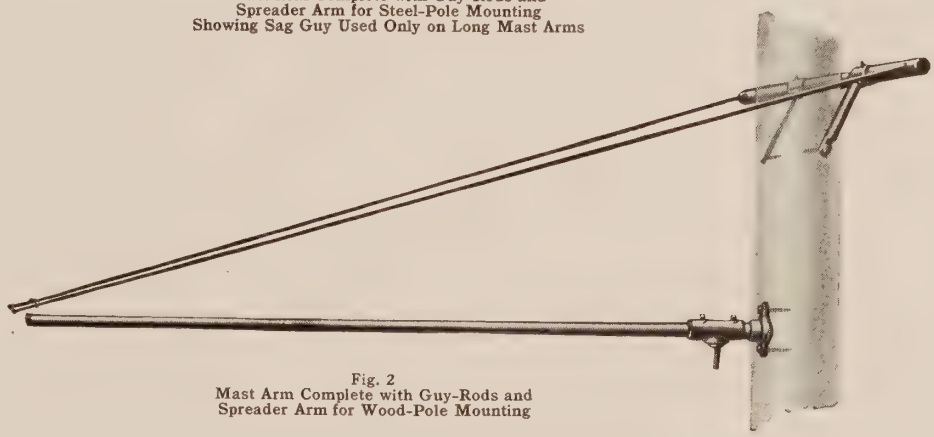


Fig. 2
Mast Arm Complete with Guy-Rods and
Spreader Arm for Wood-Pole Mounting

For convenience in mounting traffic signals on mast arms, there are listed below mast arms of various lengths and for various sizes of poles. They are listed complete with the mast arm, top guys, spreader arm, and the necessary fittings. Mast arms are made from 8 to 25 feet in length. With mast arms from 8 to 12 feet long, two top guy-rods are furnished; with mast arms from 13 to 17 feet long, three top guy-rods are furnished; and with mast arms over 17 feet, four guy-rods are furnished. Listed below are mast arms 8, 13, and 18 feet long. The fitting for the end of the mast arm which supports the signal is not included in the listing of the mast arm, since this fitting is an inherent part of the signal.

The mast arms proper are made of a 2-inch pipe, and the guy-rods, of ½-inch diameter steel. At the end of the mast arm next to the pole, there is a cast bronze fitting through which the wires enter the mast arm. This fitting is not threaded but is provided with set screws to hold the pipe firmly in place. Threading is unnecessary since the pipe is under compression at all times.

These mast arms are sufficiently strong to hold up any mast-arm signal.

Description		8 Feet Long★		13 Feet Long★		18 Feet Long★	
		Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
Complete	For 3-Inch Tubular Steel Pole. (Fig. 1)	HL3037	$28.00	HL3002	$40.00	KL3169	$52.00
	For 4-Inch Tubular Steel Pole. (Fig. 1)	HL3038	28.00	HL3003	40.00	KL3170	52.00
	For 5-Inch Tubular Steel Pole. (Fig. 1)	HL3039	28.00	HL3004	40.00	KL3171	52.00
	For 6-Inch Tubular Steel Pole. (Fig. 1)	HL3040	28.00	HL3005	40.00	KL3172	52.00
	For 7-Inch Tubular Steel Pole. (Fig. 1)	HL3041	28.00	HL3006	40.00	KL3173	52.00
	For 8-Inch Tubular Steel Pole. (Fig. 1)	HL3042	28.00	HL3007	40.00	KL3174	52.00
	For 9-Inch Tubular Steel Pole. (Fig. 1)	HL3043	28.00	HL3008	40.00	KL3175	52.00
	For 10-Inch Tubular Steel Pole. (Fig. 1)	KL3873●	28.00	KL3874●	40.00	KL3875●	52.00
	For Wood Pole. (Fig. 2)	HL2951	28.00	HL2956	40.00	KL3176	52.00

Due to the expense of manufacturing, boxing, and transportation, mast arms can often be purchased to advantage locally. To those purchasers who wish to take advantage of this saving, the Crouse-Hinds Company will supply pole clamps, listed on page 5; spreader arms, and wire outlet and slip fitter, listed on page 4 of this section.

★For intermediate lengths, add to the list prices $1.00 per foot up to 12 feet; for lengths 14 to 17 feet, add $2.00 per foot to the price of the 13-foot mast arm; and for lengths 19 to 25 feet, add $2.00 per foot to the price of the 18-foot mast arm. For mast arms over 25 feet long, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

●Denotes addition and change in illustration.

CROUSE-HINDS

Accessories•

For Mast Arms

Fig. 3
Spreader Arm for Guy Rods
For Use on Tubular Steel Poles

Fig. 4
Spreader Arm for Guy Rods
For Use on Wood Poles

Fig. 5
Wire Outlet and Slip Fitter
For Mast Arms

Fig. 6
Mast Arm Head and
Universal Joint

Fig. 7
Sag Guy Support

Figs. 3 and 4 illustrate spreader arms for mast arms. These are mounted on the pole about 2½ to 3 feet above the mast arm, and the guy rods are fastened to the spreader arm. The use of spreader arms with top guys prevents any side sway of the mast arm.

Fig. 5 illustrates a wire outlet and slip fitter for use with 2-inch mast arms. This is a heavy bronze casting, one end of which slips over a nipple in the mast-arm pole clamp, and the mast arm slips into the other end of the outlet. The slip fitter is locked in place with set screws.

Fig. 6 shows a standard mast arm head complete with universal joint for 2-inch arms, and Fig. 7 shows a support for the center sag guys, designed to take one, two, or three guy rods.

	Description	Cat. No.	List, each
Spreader Arm Complete	For 3-Inch Tubular Steel Pole. (Fig. 3)	HL9055	$ 7.60
	For 4-Inch Tubular Steel Pole. (Fig. 3)	HL9056	8.00
	For 5-Inch Tubular Steel Pole. (Fig. 3)	HL9057	9.00
	For 6-Inch Tubular Steel Pole. (Fig. 3)	HL9058	9.80
	For 7-Inch Tubular Steel Pole. (Fig. 3)	HL9059	11.00
	For 8-Inch Tubular Steel Pole. (Fig. 3)	HL9060	11.80
	For 9-Inch Tubular Steel Pole. (Fig. 3)	HL9061	12.20
	For 10-Inch Tubular Steel Pole. (Fig. 3)	KL3876	13.00
	For Wood Pole. (Fig. 4)	HL2923	9.00
Wire Outlet and Slip Fitter for 2-Inch Arms. (Fig. 5)		HL9063	$ 7.00
Mast Arm Head and Universal Joint for 2-Inch Arms. (Fig. 6)		HL319	6.30
Sag Guy Support for 2-Inch Arms. (Fig. 7)		KL3828	3.50

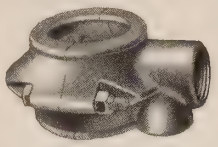
•Denotes revision.

CROUSE-HINDS

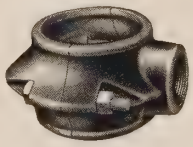
Pole Clamps and Mounting Attachments•

For Signals and Control Boxes

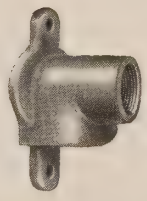
Pole Clamps for 1½-Inch Bracket Arms with 1¼-Inch Downward Hub†

Illustrations	Cat. No.	List, each★	Diameter Nominal Inside	Diameter Actual Outside	Cat. No.	List, each★	Illustrations
	Single Hub				**Double Hub**		
	KL3134	$3.20	3″	3½	KL3161	$4.20	
	KL3135	3.60	4″	4½	KL3162	4.60	
	KL3136	4.00	5″	5 9/16	KL3163	5.00	
	KL3137	4.40	6″	6⅝	KL3164	5.40	
	KL3138	5.00	7″	7⅝	KL3165	6.00	
	KL3139	5.80	8″	8⅝	KL3166	6.80	
	KL3140	6.80	9″	9⅝	KL3167	7.80	
	KL3141	9.00	10″	10¾	KL3168	10.00	

Pole Clamps for 2-Inch Bracket Arms without Downward Hub‡

	Single Hub				**Double Hub**		
	HL9048	$3.60	3″	3½	HL2479	$4.60	
	HL9049	4.00	4″	4½	HL2480	5.00	
	HL9050	5.00	5″	5 9/16	HL2490	6.00	
	HL9051	5.80	6″	6⅝	HL2491	6.80	
	HL9052	7.00	7″	7⅝	HL2492	8.00	
	HL9053	7.80	8″	8⅝	HL2493	8.80	
	HL9054	8.20	9″	9⅝	HL2494	9.20	
	KL3132	9.00	10″	10¾	*		

Pole Clamps without Hubs‡ For Mast Arm Guys					Cabinet Saddles		
	KL3865	$2.00	3″	3½	*		
	KL3866	3.00	4″	4½	HL8934	$2.00	
	KL3867	4.00	5″	5 9/16	HL8935	2.20	
	KL3868	4.80	6″	6⅝	HL8936	2.40	
	KL3869	6.00	7″	7⅝	HL8937	2.60	
	KL3870	6.80	8″	8⅝	HL8938	3.50	
	KL3871	7.20	9″	9⅝	*		
	KL3872	8.00	10″	10¾	*		

Wood-Pole Plate for 1½-Inch Arms† With 1¼-Inch Downward Hub				Wood-Pole Plate for 2-Inch Arms‡		
	KL2428	$2.00	For All Wood Poles	HL9062	$2.00	

★For intermediate sizes, use price of next size larger clamp.
*Not made.
†Standard for all traffic signals.
‡Standard for all mast arms.
•Denotes revision.

CROUSE-HINDS

Mounting Attachments•

For Controller Cabinets

Fig. 1
Wood-Pole Bracket

Fig. 2
Pedestal Adapter
For 3-Inch Pipe

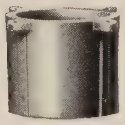


Fig. 3
Pedestal Adapter
For 4-Inch Pipe

Fig. 4
Adjustable Steel-Pole Band

Fig. 5
Wood-Pole Strap

Description	Cat. No.	List, each
Wood-Pole Bracket (Fig. 1)	KL3401	$2.50
3-Inch Pedestal Adapter (Fig. 2)	KL3402	8.00
4-Inch Pedestal Adapter (Fig. 3)	KL3403	8.00
Wood-Pole Strap for Size 12 Cabinet Only (Fig. 5)	KL3404	1.00
Wood-Pole Strap for Size 11 Cabinet Only (Fig. 5)	KL3406	1.00
Wood-Pole Strap for All Cabinets except Sizes 11 and 12 (Fig. 5)	KL3405	1.00
Adjustable Steel-Pole Band (Fig. 4)	HL8842	1.60

Foundation Forms

For All Pedestal and Post-Type Signals and Beacons

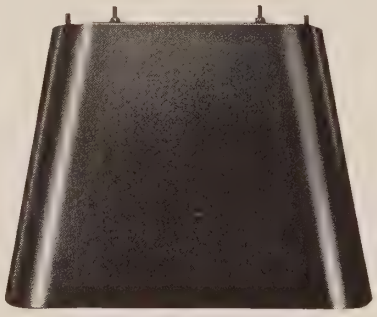


Fig. 6
Foundation Form
For Pedestal-Type Signals and Beacons

Fig. 7
Foundation Form
For Post-Type Signals and Beacons

These foundation forms are for use on the concrete foundation of pedestal or post-type signals and beacons. They are made of No. 10 U. S. gauge iron (.140 inches thick), formed up and butt-welded into a solid form. They are well braced and have a number of hooks riveted to the inside to anchor them securely to the concrete. They not only serve as a form in which the concrete foundation is molded, but also as a permanent protecting shield to the concrete. The top edge is turned over and is accurately drilled for setting the foundation bolts. Foundation bolts are furnished with these forms.

The use of these forms on concrete foundations protects the concrete and insures the correct installation of all pedestal and post-type signals and beacons. They are properly shaped to insure illumination by the base light.

The corners of HL8469 foundation form are rounded to conform to the corners of the base casting of pedestal-type signals and beacons.

Foundation form HL9172 is arranged to take ordinary traffic signal poles and pedestals listed in section 609.

It is recommended that the concrete foundation extend 18 inches below the roadway.

Description	Outside Dimensions			Net Wt.	Cat. No.	List, each
	Diameter		Depth			
	Top	Bottom				
Square Foundation Form	30	40	30	190 lbs.	HL8469	$51.00
Round Foundation Form	24	36	30	190 lbs.	HL9172	40.00

•Denotes revision.

CROUSE-HINDS

Sign Holders•

For Suspended-Type Signals

Fig. 1
Four-Way Sign Holder without Auxiliary Light for use with all Signals with Base Lights

Fig. 2
Four-Way Sign Holder with Auxiliary Light for use with Three-Section Signals Without Base Lights

Fig. 3
One-Way Sign Holder For Use with Non-Adjustable Signals

Fig. 4
One-Way Sign Holder For Use with Adjustable Signals

It is very often necessary to place information signs on the bottom of suspended-type signals to convey special information to traffic. Illustrated above are four sign holders for use with standard Crouse-Hinds signals. They are designed to take 9 x 13-inch translucent glass signs, but the sign holders shown in Figs. 1 and 2 will also take the 10 x 14-inch porcelain enameled signs. If it is desired that the signs be readable both day and night, the translucent glass signs should be used instead of the porcelain enameled signs.

For those signals having a base light it is, of course, advisable that translucent glass signs be used, so that the signs are readable both day and night. For non-adjustable signals not already equipped with a base light, the Crouse-Hinds Company can furnish a sign holder with an auxiliary lamp receptacle so that translucent signs may be used.

Signs for sign holders listed below are listed on page 8 of this section, and must be ordered separately.

All sign holders are designed to take four signs, but, if it is only desired to display signs in two or three directions, blank plates may be used in place of the signs.

If signals are ordered complete with signs, the proper sign holder will be mounted on the signal.

When ordering sign holders for signals already installed, it is necessary to specify the type of signal body; either die cast plate type, one piece, or sectional.

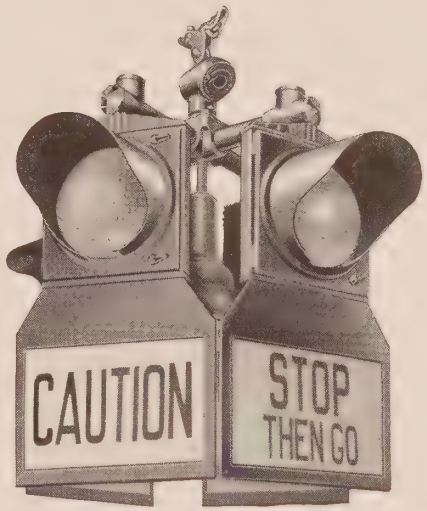


Fig. 5
Four-Way Adjustable Beacon With Base Light and Four One-Way Sign Holders

Sign Holders—Without Signs

Take 9 x 13-Inch Translucent Glass Information Signs

Description	For Signals with Base Light		For Signals without Base Light	
	Cat. No.	List, each★	Cat. No.	List, each★
Four-Way Sign Holders				
Without Auxiliary Lamp Receptacle (Fig. 1)	HL798	$12.00	HL799	$12.00
With Auxiliary Lamp Receptacle (Fig. 2)	†		HL823	12.00
One-Way Sign Holders				
For Use with Non-Adjustable Signals (Fig. 3)	KL1765	$2.20	†	
For Use with Adjustable Signals (Fig. 4)	KL1757	2.20	†	

★Prices do not include translucent glass signs. They must be ordered separately. See listing on page 8 of this section.
†Not made. •Denotes revised listing.

CROUSE-HINDS

Information Signs

For Pedestal and Suspended-Type Signals

Porcelain Enameled Steel or Translucent Glass

Fig. 6

Fig. 7

Fig. 8

Fig. 9

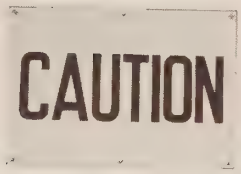


Fig. 10

Fig. 11

Fig. 12

Fig. 13

Fig. 14

Fig. 15

Fig. 16

Fig. 17

The signs shown on this page are regularly carried in stock at Syracuse. The porcelain enameled steel signs are usually used on pedestal-type signals, and the translucent glass signs, on suspended-type signals.

Signs bearing any desired wording can be made up on special order, but, unless such orders are for at least 20 signs of a kind, each having not more than 25 letters, an extra charge will be made.

Special signs can be made in any desired colors. Standard signs are printed in two colors only, with the exception of catalog number HL8369, which is printed in three colors.

10 x 14-inch signs are for use only with four-way sign holders, and 9 x 13-inch signs are for use only with one-way sign holders.

Information Signs•

Description	Porcelain Enameled Steel 10 x 14 Inches		Translucent Glass Complete with Frame 10 x 14 Inches		Translucent Glass Without Frame 9 x 13 Inches	
	Cat. No.	List, each	Cat. No.	List, each	Cat. No.	List, each
DRIVE TO RIGHT (Fig. 6)	HL8366	$1.80	HL761	$6.40	HL781	$4.20
SAFETY ZONE (Fig. 7)	HL8428	1.80	HL762	6.40	HL782	4.20
STOP THEN GO (Fig. 8)	†		KL1731	6.40	KL1791	4.20
STOP—BOULEVARD (Fig. 9)	HL8369	1.80	HL764	6.40	HL9890	4.20
CAUTION (Fig. 10)	†		HL776	6.40	KL1799	4.20
NO TURN (Fig. 11)	HL8491	1.80	HL766	6.40	HL792	4.20
NO LEFT TURN (Fig. 12)	HL8367	1.80	HL767	6.40	HL225	4.20
NO U TURN (Fig. 13)	HL9254	1.80	HL768	6.40	HL793	4.20
NO TURNS ON RED (Fig. 14)	HL9553	1.80	HL769	6.40	HL9463	4.20
ALL TURNS ON GREEN (Fig. 15)	HL9945	1.80	HL770	6.40	HL9764	4.20
TURN IN FRONT (Fig. 16)	HL8702	1.80	HL771	6.40	HL794	4.20
CAUTION—DANGEROUS CROSSING (Fig. 17)	HL8368	1.80	HL763	6.40	HL783	4.20
DRIVE SLOW*	HL8626	1.80	HL765	6.40	HL784	4.20
TURN LEFT ON WHITE*	HL8569	1.80	HL772	6.40	HL9763	4.20
Blank Metal Plate for Four-Way Sign Holders	HL5414	$1.00	.....		.....	

*Not illustrated. •Denotes revised listing.
†Not made.

CROUSE-HINDS

Information Signs

For Horizontal Bracket-Arm Signals

Porcelain Enameled Steel

Fig. 1

Fig. 2

Fig. 3

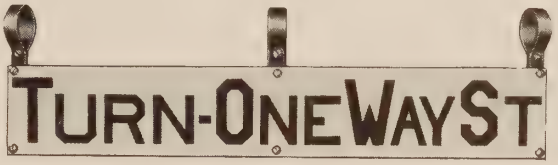


Fig. 4

Fig. 5

Fig. 6

Fig. 7

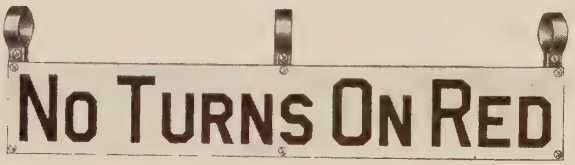


Fig. 8

Signs shown on this page are regularly carried in stock at Syracuse.

Signs bearing any desired wording can be made up on special order, but, unless such orders are for at least 20 signs of a kind, each having not more than 25 letters, an extra charge will be made.

Special signs can be made in any desired colors. Standard signs are printed in two colors only. These information signs are furnished complete with three clamps for fastening to 1½ or 2-inch diameter bracket arms.

Information Signs

33 x 5½ Inches—Porcelain Enameled Steel

Description	Sign with 3 Clamps		Sign Less Clamps	
	Cat. No.	List, each	Cat. No.	List, each
NO LEFT TURN (Fig. 1)	HL7986	$4.60	HL7979	$3.40
NO RIGHT TURN (Fig. 2)	HL8635	4.60	HL8424	3.40
NO TURNS—THRU ST. (Fig. 3)	HL8636	4.60	HL8427	3.40
TURN—ONE-WAY ST. (Fig. 4)	HL9532	4.60	HL8426	3.40
ONE-WAY ST. EXIT (Fig. 5)	HL8634	4.60	HL8425	3.40
TURN RIGHT ON RED (Fig. 6)	HL8637	4.60	HL8592	3.40
NO U TURN (Fig. 7)	HL777	4.60	HL9966	3.40
NO TURNS ON RED (Fig. 8)	HL778	4.60	HL9852	3.40
Clamp Only, for All Signs	HL779	$ .40	.....	

CROUSE-HINDS

Hoods, Angle Adapters, and Balance Adjuster

Sheet Aluminum Hoods

Fig. 9
Standard Hood
8 Inches Long

Fig. 10
Right-Hand Hood
8 Inches Long

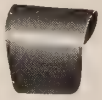


Fig. 11
Left-Hand Hood
8 Inches Long

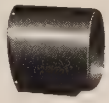


Fig. 12
Combination Hood
8 Inches Long

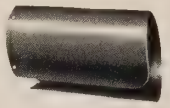


Fig. 13
Combination Hood
12 Inches Long

All of the new Crouse-Hinds signals listed in this Catalog, with the exception of beacons and horizontal signals, are equipped with cast aluminum hoods which are cast with the door frame in one unit. However, when the order so states, signals will be equipped with any standard hood not exceeding 8 inches in length at no extra charge.

Hood shown in Fig. 9 is exactly the same shape as the standard cast hood. Figs. 10 and 11 show right-hand and left-hand hoods respectively, and are often used on signals equipped with 30° and 45° angle adapters. Figs. 12 and 13 show combination hoods, often used to control streets making a sharp angle with each other. Such combination hoods prevent confusion since they limit the signal indication to the stream of traffic to be controlled by it.

Description		Cat. No.	List, each
Hoods	Standard Sheet Aluminum, 8 Inches Long	KL9	$1.80
	Right-Hand Sheet Aluminum, 8 Inches Long	KL453	1.80
	Left-Hand Sheet Aluminum, 8 Inches Long	KL454	1.80
	Combination Sheet Aluminum, 8 Inches Long	KL455	1.80
	Combination Sheet Aluminum, 12 Inches Long	KL456	4.80•

Angle Adapters and Balance Adjuster

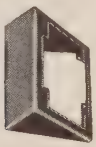


Fig. 14
15° Angle Adapter
Left Side High

Fig. 15
30° Angle Adapter
Left Side High

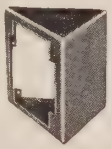


Fig. 16
45° Angle Adapter
Right Side High

At intersections where streets do not cross at right angles to each other, it is often possible to use standard four-way signals by equipping one or more faces with the angle adapters shown above. These angle adapters are fastened to the signal faces and are gasketed. The entire optical system is then fastened to the angle adapter rather than to the signal housing proper, thus directing the signal indication along the angle street.

When ordering angle adapters, it is advisable to submit a sketch of the intersection, showing the proposed location of the signal and the angles at which the streets intersect. If such a sketch is submitted, the correct angle adapter will be shipped with the signal and will be mounted on the signal in the right direction. Angle adapters are reversible so either right or left side may be high.

Fig. 17
Balance Adjuster

Pendent signals equipped with angle adapters, or from which one face is missing, will not hang plumb; and while this may not be objectional from a signaling standpoint, it may spoil the good appearance of the installation. To overcome this difficulty such signals may be equipped with Crouse-Hinds balance adjuster, illustrated in Fig. 17. The balance adjuster is inserted between the wire outlet and the span-wire or mast-arm hanger, as illustrated in Fig. 2 of section 601, page 19. After installation, the adjusting screw is moved to make the signal hang true. All parts of the balance adjuster are made of high strength bronze.

Description		Complete with Hinge and Catch Brackets	
		Cat. No.	List, each
Angle Adapters	15° Angle	KL430	$12.00•
	30° Angle	KL431	15.00•
	45° Angle	KL432	18.00•
Balance Adjuster		HL305	$4.60

•Denotes price change.

CROUSE-HINDS

Relays for Control Circuits

6-Ampere, 115-Volt, 60-Cycle A. C.

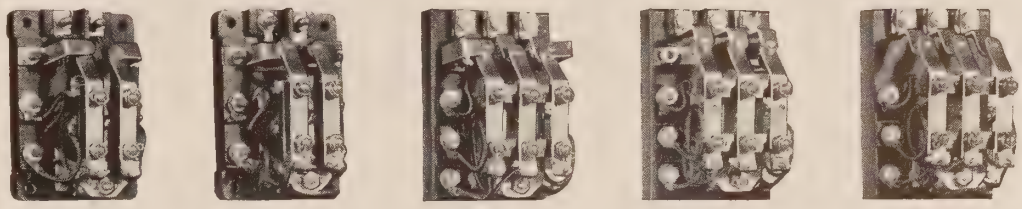


Fig. 1 KL460, KL461 — Fig. 2 KL462 — Fig. 3 KL463 — Fig. 4 KL464 — Fig. 5 KL465

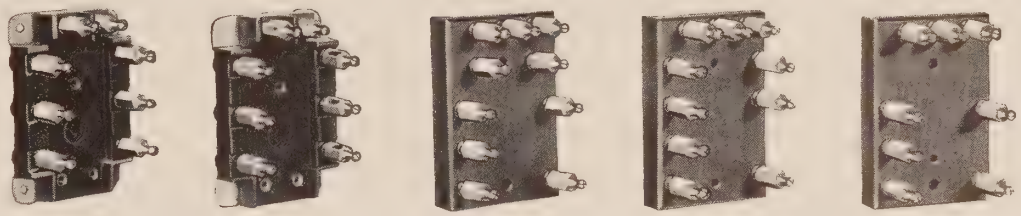


Fig. 6 KL466 — Fig. 7 KL466 — Fig. 8 KL467 — Fig. 9 KL468 — Fig. 10 KL469

Crouse-Hinds relays for control circuits are especially designed for traffic signal work, and the design has been thoroughly tested by years of actual installation in controls. They meet every demand for reliability, ruggedness, and durability. The rating of all relays is 6 amperes at 115 volts, 60 cycles A. C. They are designed to give both quick-make and quick-break, and the contacts are self-wiping, thus insuring positive operation and clean contacts.

They are small and compact, measuring 2¾ inches high and 1⅞ inches wide. With jack-mounted bases, relays may be removed from their bases without disturbing any of the control wiring.

Just above Figs. 1 to 5 are shown contact diagrams. In the positions shown, the relay coils are not energized and the relay armatures are making contact with the "back contacts." When power is applied to the relay coil, the "back contacts" are broken and the armatures are held against the top or "front contacts."

Description		Type	Number of Contacts		Cat. No.	List, each
			Front (Power On)	Back (Power Off)		
Relays	Plain Mounting (Fig. 1)	CDBX-1	2	2	KL460	$ 9.00
	Jack Mounting (Fig. 1)	CS-808A	2	2	KL461	9.00
	Jack Mounting (Fig. 2)	CX-1179	2	1	KL462	9.00
	Jack Mounting (Fig. 3)	CX-1066	3	2	KL463	11.40
	Jack Mounting (Fig. 4)	CXC-1066	2	3	KL464	11.40
	Jack Mounting (Fig. 5)	CXE-1066	3	0	KL465	11.40
Jack Mounted Bases	For KL461, KL462 (Figs. 6, 7)	.....	..	..	KL466	$ 1.60
	For KL463 (Fig. 8)	.....	..	..	KL467	1.80
	For KL464 (Fig. 9)	.....	..	..	KL468	1.80
	For KL465 (Fig. 10)	.....	..	..	KL469	1.80

CROUSE-HINDS

Relays for Control Circuits

15-Ampere, 115-Volt, 60-Cycle A. C.

Fig. 11
KL473

Fig. 12
KL474

Fig. 13
KL475

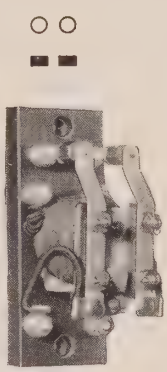


Fig. 14
KL476

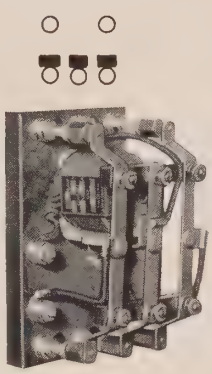


Fig. 15
KL477

Crouse-Hinds relays listed on this page have a capacity of 15 amperes at 115 volts A. C. and are used in some types of "Trafflex" controls and in the type TFR Traffic Flow Regulators.

They are designed to give both quick-make and quick-break, and the contacts are self-wiping, thus insuring positive operation and clean contacts.

All relays are 5 inches high and 2 inches wide except KL477 which is 3¼ inches wide.

Just above Figs. 11 to 15 are shown contact diagrams. In the positions shown, the relay coils are not energized and the relay armatures are making contact with the "back contacts." When power is applied to the relay coil the "back contacts" are broken and the armatures are held against the top or "front contacts."

Description	Type	Number of Contacts		Cat. No.	List, each•
		Front (Power On)	Back (Power Off)		
"Trafflex" Remote Amber (Fig. 11)	CS-10	2	2	KL473	$15.00
"Trafflex" Remote All-Red (Fig. 12)	CS-81	2	2	KL474	16.40
"Trafflex" Remote Shut-down (Fig. 13)	CS-82	0	1	KL475	8.80
"Trafflex" Remote Manual Automatic (Fig. 14)	CS-95A	2	0	KL476	11.00
TFR Remote Off Duty (Fig. 15)	CS-322	2	3	KL477	16.40

•Denotes price changes.

CROUSE-HINDS

Cabinet Mountings

Fig. 1
Steel-Pole Mounting
With Adjustable Pole Bands

Fig. 2
Wood-Pole Mounting
With Wood-Pole Straps

Fig. 3
Steel-Pole Mounting
With Steel-Pole Saddles

Fig. 4
Wood-Pole or Wall Mounting
With Wood-Pole Brackets

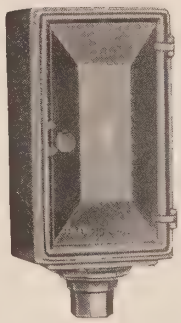


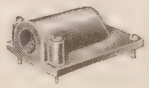
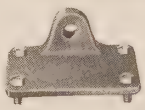
Fig. 5
With Pedestal Adapter

Fig. 6
With Ground Pedestal
(Cat. No. 45935)

Above are illustrated typical mountings for Crouse-Hinds control cabinets. For mounting on steel, cast iron, or concrete poles, the adjustable steel-pole band, illustrated in Fig. 1, is standard. For mounting on wood poles, the standard mounting is with wood-pole straps, illustrated in Fig. 2. Mountings shown in Figs. 3 and 4 furnished on special order only.

Listed below is a complete line of YYP8 series hub plates, any of which may be used on Crouse-Hinds control cabinets. The 1-inch hub plate, Cat. No. YYP83S, will be furnished on all size 12 cabinets and the 1½-inch hub plate, Cat. No. YYP85S, will be furnished on all other cabinets. These are standard unless the order definitely specifies another size.

Conduit Hub Plates—YYP8 Series—3¼ x 4⅝ Inches—Cast Feraloy

Illustrations	Style	Cat. No.	List, each	Size	Cat. No.	List, each	Style	Illustrations
	One Hub Straight	YYP81S	$ .70	½	YYAP81S	$ .80	One Hub 90° Back or Front	
		YYP82S	.80	¾	YYAP82S	.90		
		YYP83S	.90	1	YYAP83S	1.00		
		YYP84S	1.00	1¼	YYAP84S	1.10		
		YYP85S	1.10	1½	YYAP85S	1.20		
		YYP86S	1.20	2	YYAP86S	1.30		
		YYP87S	1.30	2½	.....	...		
	Two Hubs Straight	YYP811S	$ .90	½	YYLP81S	$ .80	One Hub 90° Left or Right	
		YYP822S	1.00	¾	YYLP82S	.90		
		YYP833S	1.10	1	YYLP83S	1.00		
		YYP844S	1.20	1¼	YYLP84S	1.10		
		.....	...	1½	YYLP85S	1.20		
		.....	...	2	YYLP86S	1.30		
	Blank	YYP800S	$ .50	...	YYP801S	$ .90	Blank With Ear	

Gasket

	...	KL1797	$ .30	

CROUSE-HINDS

Ornamental Poles

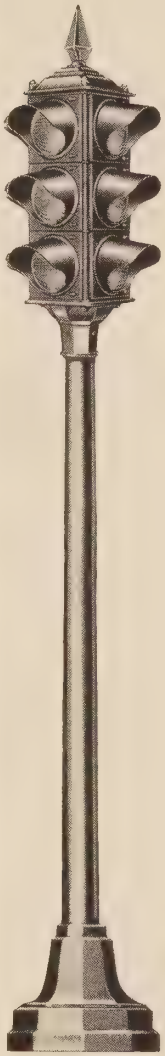


Fig. 1
Type TSP-443D
Four-Way Signal
Mounted on
Crouse-Hinds Pole

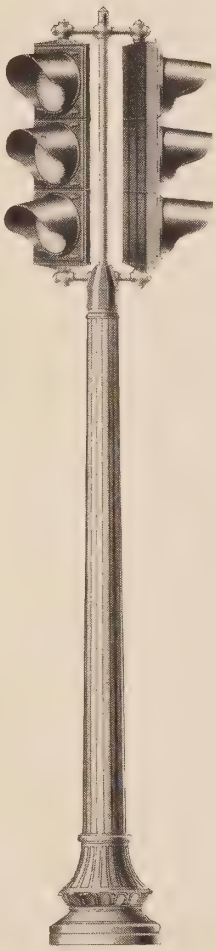


Fig. 2
Type TRP-223D
Two-Way Signal
Mounted on
Ornamental Pole

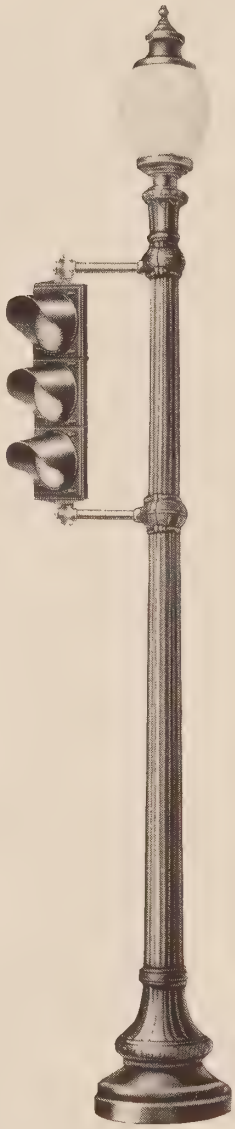


Fig. 3
Type TSV-113D
One-Way Signal
Mounted on Single-Light
Ornamental Pole

Fig. 4
Type TSP-113D
One-Way Signal
Mounted on
Ornamental Pole

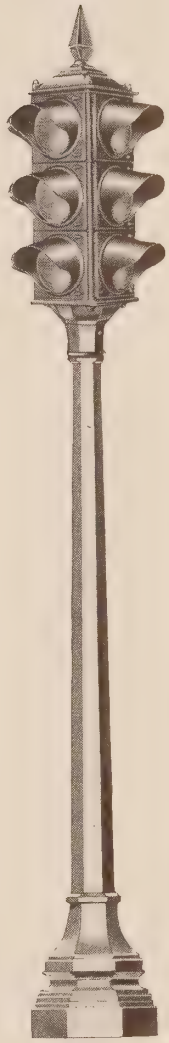


Fig. 5
Type TSP-443D
Four-Way Signal
Mounted on
Ornamental Pole

The Crouse-Hinds Company does not manufacture any ornamental poles for traffic signals, but, for the convenience of its customers, there are illustrated and listed on pages 2 to 8 of this section, poles of various manufacture. Crouse-Hinds does not stock these ornamental poles, and would prefer that cities purchase poles direct from the manufacturer.

The Crouse-Hinds Company does describe and list on page 7 of this section, a pole with a 4-inch pipe shaft, and an ornamental cast Feraloy base.

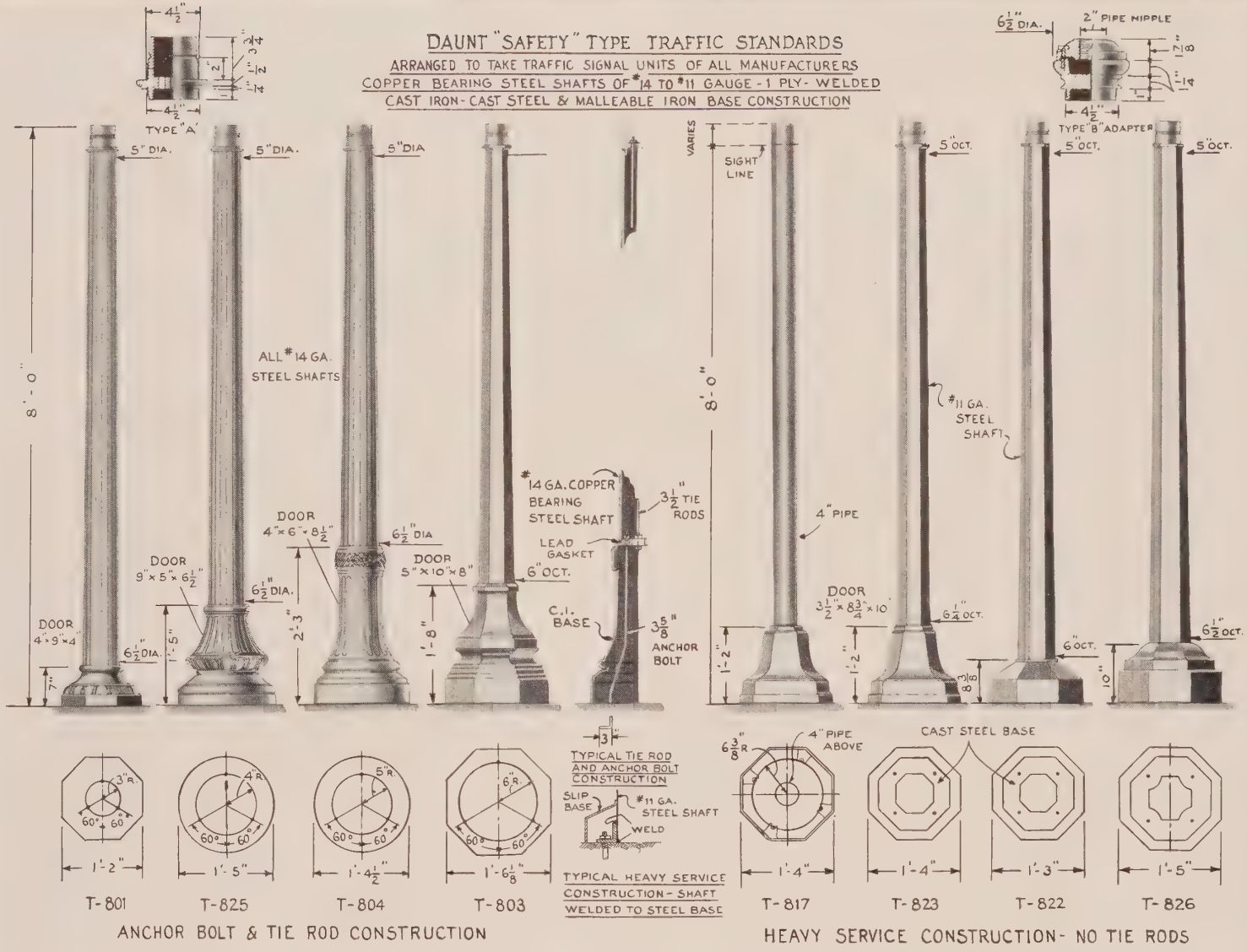


Fig. 6
Traffic Signal Poles Manufactured by The Daunt Corporation, Long Island City, N. Y.
See Listings on Page 8

CROUSE-HINDS

Ornamental Poles

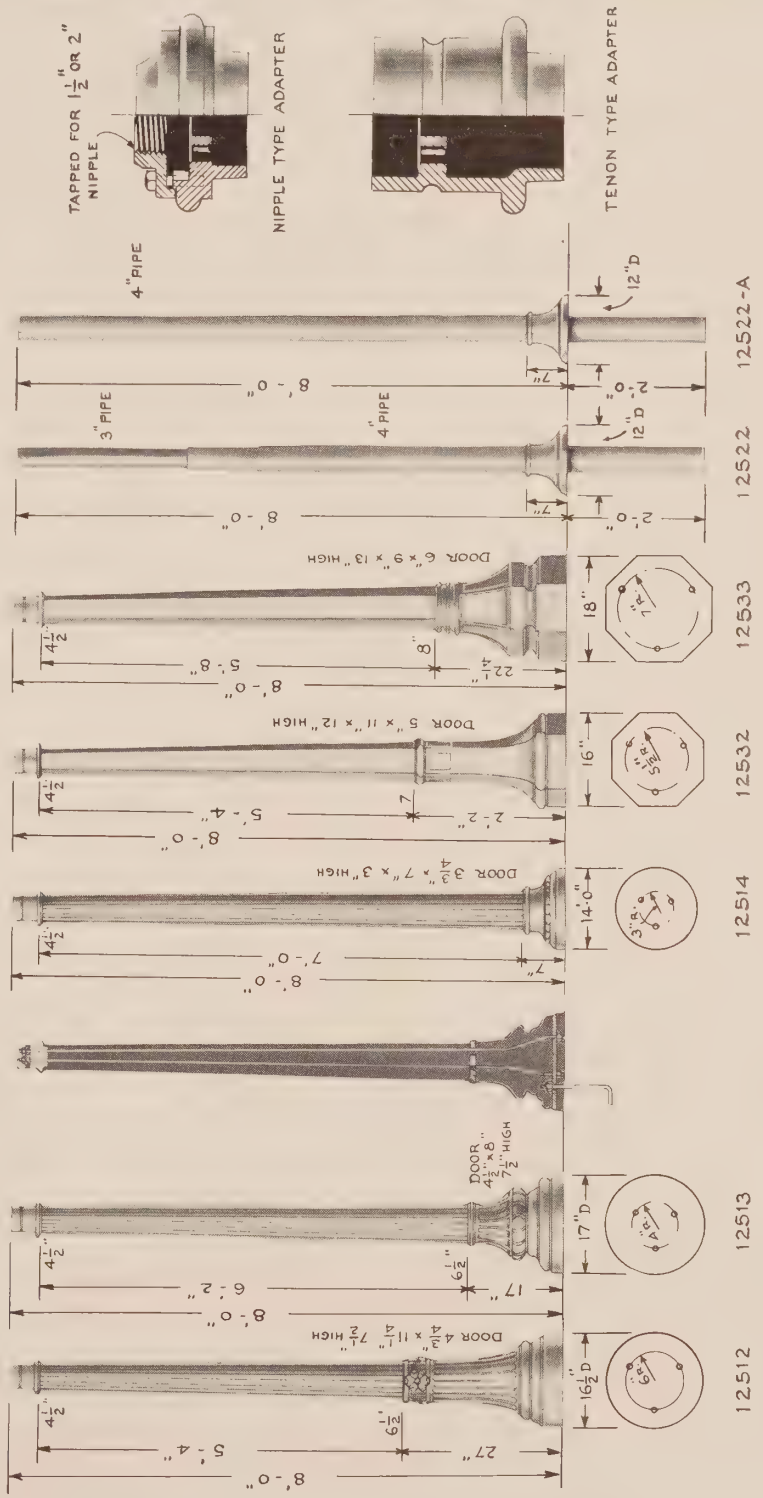


Fig. 1
Traffic Signal Poles Manufactured by Electric Railway Equipment Company, Cincinnati, Ohio
See Listings on Page 8

CROUSE-HINDS

Ornamental Poles

Fig. 2
Traffic Signal Poles Manufactured by Westinghouse Electric & Manufacturing Company, Cleveland, Ohio

See Listings on Page 8

CROUSE-HINDS

Ornamental Poles

Fig. 1 ●
Traffic Signal Poles Manufactured by Union Metal Manufacturing Company, Canton, Ohio
See Listings on Page 8

●Denotes change in illustration.

CROUSE-HINDS

Ornamental Poles

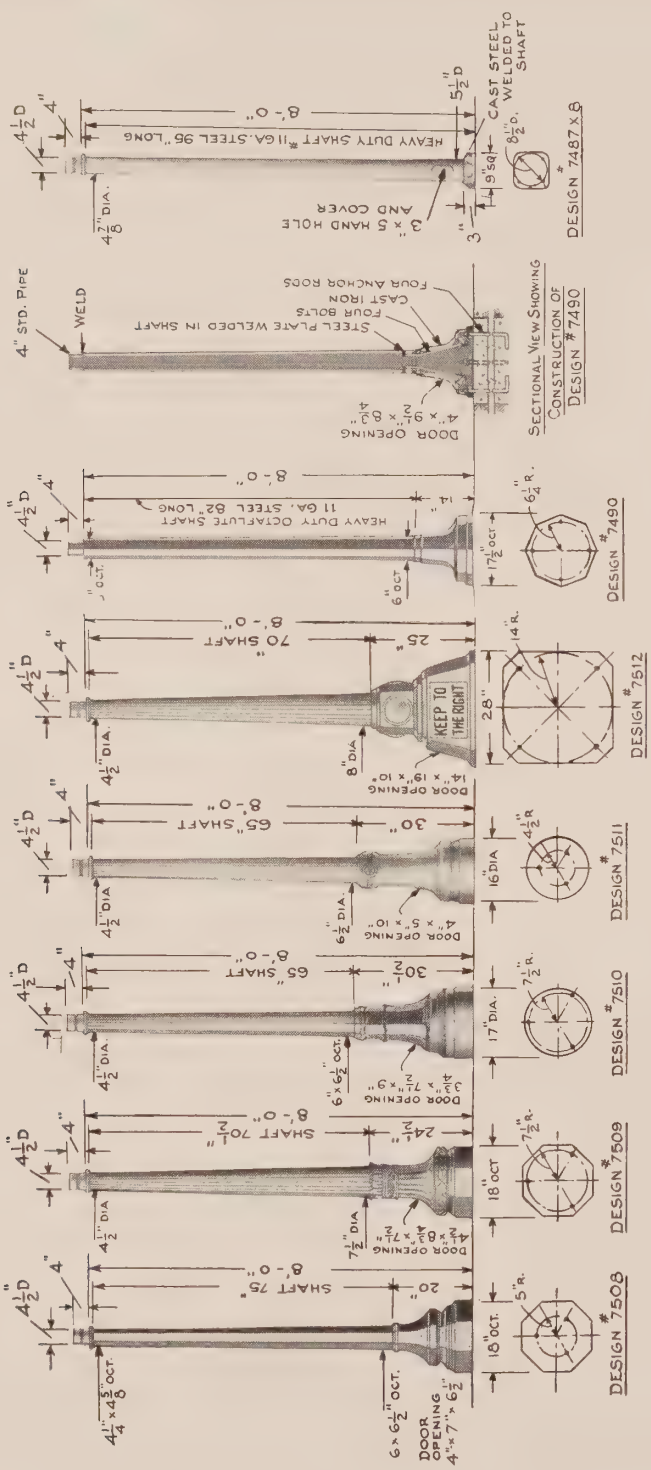


Fig. 2●
Traffic Signal Poles Manufactured by Union Metal Manufacturing Company, Canton, Ohio
See Listings on Page 8

●Denotes change in illustration.

CROUSE-HINDS

Crouse-Hinds Pedestals and Poles*

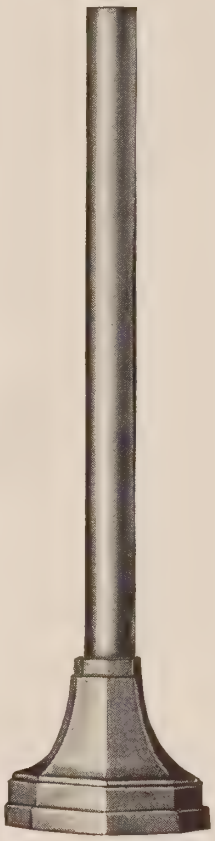


Fig. 1
Pole with Ornamental Base
and 4-Inch Pipe Shaft

The poles and pedestals listed on this page consist of an ornamental cast Feraloy base with a shaft of tubular steel. The short 34-inch pedestal is equipped with a shaft of either 3 or 4-inch diameter pipe, and is designed for mounting control cabinets. The longer poles, for mounting signals, have a tubular steel shaft of 4-inch pipe and are furnished with an overall height of from 5 to 10 feet.

These poles and pedestals should, of course, be mounted on concrete foundations. They require four foundation bolts, ¾-inch in diameter and 16 to 18 inches long. The foundation bolts are not included in the catalog numbers listed below. In the ornamental base, there is a door which is fastened to the base with machine screws. The opening of this door is 8 1/16 inches high, 2½ inches wide at the top, and 10¾ inches wide at the bottom. This large opening provides ample space for making splices and is sufficiently large to take the type TSS-16 motor flashing switch for the electric flashing beacon.

Foundation form HL9172 for these poles is listed in section 608, page 6.

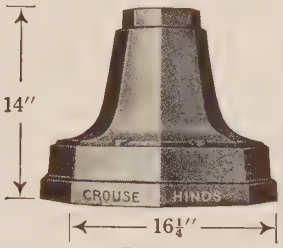


Fig. 2
Ornamental Base
For Pedestal and Poles

Fig. 3
34-Inch Pedestal
With 3-Inch Pipe Shaft

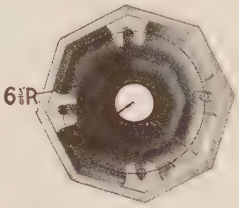


Fig. 4
Ornamental Base
Foundation Bolt Drawing

1½-Inch Nipple Mounting				4-Inch Tenon Mounting			
Height	Net Weight	Cat. No.	List, each	Height	Net Weight	Cat. No.	List, each
5 Feet	110 lbs.	46091	$42.40	5 Feet	110 lbs.	45670	$42.40
6 Feet	121 lbs.	46092	44.40	6 Feet	121 lbs.	45671	44.40
7 Feet	132 lbs.	46093	46.40	7 Feet	132 lbs.	45672	46.40
8 Feet	143 lbs.	46094	48.40	8 Feet	143 lbs.	45673	48.40
9 Feet	154 lbs.	46095	50.40	9 Feet	154 lbs.	45674	50.40
10 Feet	165 lbs.	46096	52.40	10 Feet	165 lbs.	45675	52.40
Control Box Pedestal—3-Inch Pipe Shaft (Fig. 3)				34 Inches	83 lbs.	45870	$38.40
Control Box Pedestal—4-Inch Pipe Shaft				34 Inches	90 lbs.	46391	38.40
Ornamental Base Only (Figs. 2 and 4)				14 Inches	66 lbs.	45669	$34.40

*Painting: Poles, pedestals, and ornamental bases are painted to match the color of the signals, but will be painted any solid color without extra charge. Poles painted more than one color, add $8.00 to the above list prices.

CROUSE-HINDS

Traffic Signal Poles

8 Feet High

Poles Made by The Daunt Corporation§ Long Island City, New York

Manufacturer's Designation	Construction		Illustrated on Page	Weight	List, each
	Base	Shaft			
‡T-801	Cast Iron	Steel	2	125 lbs.	$68.00
‡T-802	Cast Iron	Steel	...	122 lbs.	68.00
‡T-803	Cast Iron	Steel	2	182 lbs.	90.00
‡T-804	Cast Iron	Steel	2	186 lbs.	86.50
‡T-808	Cast Iron	Steel	...	155 lbs.	$80.00
‡T-809	Cast Iron	Steel	...	134 lbs.	78.00
‡T-817	Cast Iron	Pipe	2	156 lbs.	59.00•
‡T-822	Cast Iron	Steel	2	185 lbs.	88.00•
‡T-825	Cast Iron	Steel	2	178 lbs.	$86.00•
‡T-844	Cast Steel	Steel	...	70 lbs.	76.50
‡T-884	Cast Iron	Steel	...	154 lbs.	80.00

These poles take special zonal freight rates. Consult Daunt Corporation, Long Island City, N. Y., or Crouse-Hinds Company, Syracuse, N. Y.

Poles Made by Electric Railway Equipment Company§ Cincinnati, Ohio

‡12512	Cast Iron	Steel	3	195 lbs.	$74.60
‡12513	Cast Iron	Steel	3	155 lbs.	73.40
‡12514	Cast Iron	Steel	3	100 lbs.	56.00
‡12522	Cast Iron	Pipe	3	127 lbs.	$31.50
‡12522A	Cast Iron	Pipe	3	127 lbs.	30.40
‡12532	Cast Iron	Steel	3	200 lbs.	76.50
‡12533	Cast Iron	Steel	3	255 lbs.	80.00

Poles Made by Union Metal Manufacturing Company§ Canton, Ohio

‡7504	Cast Iron	Steel	5	191 lbs.	$ 74.60★
‡7505	Cast Iron	Steel	5	112 lbs.	56.00★
‡7506	Cast Iron	Steel	5	164 lbs.	73.40★
‡7507	Cast Iron	Steel	5	185 lbs.	80.00★
‡7508	Cast Iron	Steel	6	181 lbs.	80.00★
‡7509	Cast Iron	Steel	6	260 lbs.	$ 85.00★
‡7510	Cast Iron	Steel	6	298 lbs.	104.40★
‡7511	Cast Iron	Steel	6	215 lbs.	87.20★
‡7512	Cast Iron	Steel	6	337 lbs.	148.00★
‡7516	Cast Iron	Steel	...	115 lbs.	49.40★
‡7487-X8	Cast Steel	Steel	6	89 lbs.	$49.80†
‡7490	Cast Iron	Steel	...	135 lbs.	62.00†
‡50201-Y1	Cast Iron	Pipe	...	143 lbs.	48.40†
‡50201-Y2	Cast Iron	Pipe	...	178 lbs.	60.80†

★These poles have shafts of two-ply #22 gauge steel. If specifications definitely require shafts of single-ply #14 gauge, they will be furnished without extra charge.

†These poles have monotube shafts.

Poles Made by Westinghouse Electric and Manufacturing Company Cleveland, Ohio

Sheridan	8	Granite	Granite	4	540 lbs.	$73.70★★
Beacon	8	Granite	Granite	4	575 lbs.	73.70★★
Sheridan	10††	Granite	Granite	4	770 lbs.	83.00★★
Belmont	10††	Granite	Granite	4	830 lbs.	$83.00★★
Edgewater	8	Cast Iron	Cast Iron	4	295 lbs.	76.70§
Vista	8	Cast Iron	Cast Iron	4	310 lbs.	76.70§

††These poles are 10 feet high.

★★If pole top adapter for tenon or nipple is not required, deduct $13.70 from the list prices. These poles take special discounts and terms. Consult Westinghouse Electric and Manufacturing Company at Cleveland, Ohio or the Crouse-Hinds Company at Syracuse, N. Y. for details.

‡These poles may be furnished in any desired length between 4 and 12 feet.
For poles higher than 8 feet, add to the list prices, for each foot or fraction thereof, $2.00.
For poles shorter than 8 feet, deduct from the list prices, for each full foot decrease, $2.00.
For pole heights less than 4 feet and greater than 12 feet, consult the Main Office of the Crouse-Hinds Company, Syracuse, N. Y.

§Poles are painted with dark green paint. Special finishes of any one color will be furnished without extra charge, color sample to be furnished by the customer. When special finishes are required with more than one color, add $8.00 to the list price.

•Denotes price change.

CROUSE-HINDS

Cabinets for Traffic Signal Controls

Cast Aluminum, Weatherproof—Equipped with Lock

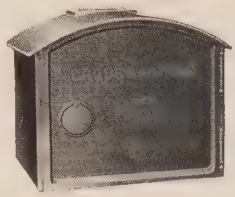


Fig. 1
Size 11 Cabinet

Fig. 2
Sizes 18, 26, 118, and 218 Cabinets

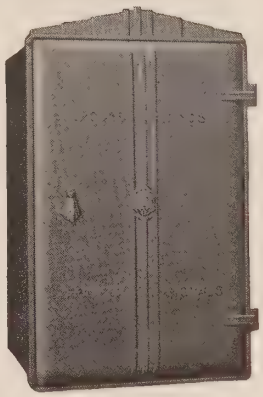


Fig. 3•
Sizes 12, 22, and 28 Cabinets

Fig. 4
Meter Cabinet

The cabinets illustrated above are normally used to house Crouse-Hinds traffic signal timers, but are often used to house other apparatus used in conjunction with a complete traffic signal system. They are made of cast silicon aluminum and have gasketed doors, making them weatherproof and suitable for outdoor use. All cabinets are furnished with a lock and two keys.

The wall thickness of all cabinets is sufficient to permit drilling and tapping for fastening apparatus to the walls. The silicon aluminum alloy from which these cabinets are made is especially strong and the castings are free from flaws and blow holes. The standard finish of all cabinets is two coats of green enamel, each separately baked.

The meter cabinet shown in Fig. 4 consists of a standard size 26 cabinet fastened to a ground pedestal, which is made of cast Feraloy for additional strength. The bottom of the size 26 cabinet is cut away and within it is mounted a wooden meter board, 28 inches high and 10 inches wide, upon which may be mounted a meter and a service entrance switch.

There is room within the ground pedestal for all necessary conduits for service and control wires.

Size 11 cabinet is cast with an opening top and bottom to take YYP8 series conduit hub plates, which are listed in section 608, page 13. Any of the hub plates shown on that page may be used on the size 11 cabinet.

Cabinets sizes 12, 18, 22, 26, 28, 118, and 218 are normally cast solid with no openings for hub plates. However, if specified on the order, cabinets will be drilled either at the top or bottom, or both, to take any of the YYP8 series hub plates.

Description	Outside Dimensions★			Cat. No.	List, each
	Height	Width	Depth		
Size 11 Cabinet	11	12 3/8	9 5/8	46168	$20.00
Size 12 Cabinet	12 1/4	8 9/16	6 5/8	46392•	13.00
Size 18 Cabinet	17 11/16	14	10 13/16	46169	36.00
Size 22 Cabinet	23 3/4	15 3/4	12 1/16	46393•	38.00
Size 26 Cabinet	25 15/16	14	12 13/16	46171	43.00
Size 28 Cabinet	29 3/4	15 3/4	12 1/16	46394•	43.00
Size 118 Cabinet	17 11/16	14	12 13/16	46170	42.00
Size 218 Cabinet	17 11/16	14	15 9/16	46395•	48.00
Meter Cabinet	26	14	12 13/16	45935	50.00•

Pedestal adapter or fitter, but not the pedestal, can be furnished at an advance of $8.00 in the list prices.
Hub plates and adjustable pole bands for steel or wood-pole mounting can be furnished at an advance of $2.50 in the list prices.
★**Dimensions,** section 613. •Denotes addition or price change.

Fig. 5
Installation of Crouse-Hinds Traffic Signals

Fig. 6
Installation of Crouse-Hinds Traffic Signals

CROUSE-HINDS

Signal Replacement Parts

Parts for One-Way Traffic Signals

Fig. 1
Exploded View of One-Way Signal Parts

CROUSE-HINDS

Signal Replacement Parts

Parts for One-Way Traffic Signals

Description	Cat. No.	List, each
Case Complete, one-section, with terminal block at top	HL6793	$ 9.50
Case Complete, two-section, with terminal block at top	HL6794	14.00
Case Complete, three-section, with terminal block at top	HL6795	18.50
Case Complete, four-section, with terminal block at top	HL6796	23.00
Case Complete, one-section, with terminal block at bottom	HL8857	9.50
Case Complete, two-section, with terminal block at bottom	HL8858	14.00
Case Complete, three-section, with terminal block at bottom	KL82	18.50
Case Complete, four-section, with terminal block at bottom	HL8860	23.00
Case Section Only, not drilled for terminal block	HL6165	4.50
Case Section Only, drilled at top for terminal block	HL6627	4.50
Case Section Only, drilled at bottom for terminal block	HL6626	4.50
End Plate	HL6166	2.00
Tie-Rod, for one-section case. 11½ inches long	HL6169	.25
Tie-Rod, for two-section case. 21 9/16 inches long	HL6170	.30
Tie-Rod, for three-section case. 31 9/16 inches long	HL6171	.35
Tie-Rod, for four-section case. 41⅝ inches long	HL6172	.40
Tie-Rod, for five-section case. 51⅝ inches long	KL85	.50
Ornamental Cap Nut, for tie-rods	HL6173	.25
Lock Washer, for cap nut. ⅜-inch, positive	HL1913	.15★
Terminal Block Complete, with fastening screws	HL6586	1.20●
Composition only, for terminal block	HL6576	.50
Brass Terminals	HL6583	.10
Nickel Terminal	HL6625	.10
Binding Screw, Brass or Nickel	9764-N	.20★
Screw, for fastening terminals to block. #6–32 x ⅝ inches long, R. H. brass	HLS12094	.30★
Screw, for fastening terminal block to casing. #8–32 x 1-inch long, R. H. brass	HLS12170	.48★
Four-Way Slip Fitter, for 4-inch pipe	HL6255	5.00●
Two-Way Slip Fitter, for 4-inch pipe	HL6256	5.00●
One-Way Slip Fitter, for 4-inch pipe	HL6267	5.00●
Set Screw, for slip fitters. ⅜″–16 x ½-inch long, headless, cup-point	HLS46545	.30★
1½-Inch Pipe Nipple. 3½ inches long, for nipple mounting posts	HL5171	.40
1½-Inch Conduit Check Nut	KL435	.10
1½-Inch Pipe Check Nut	HL5172	.15
Lead Washer, for 1½-inch pipe	KL8	.10
Cap, for one-way signal	HL6174	.30
Lead Washer, for cap, for 1¼-inch pipe	HL6175	.10
1¼-Inch Conduit Check Nut	KL418	.10
Bracket Arm Complete, without wire outlet	KL66	3.00●
Bracket Arm Complete, with wire outlet	KL67	3.00●
Bracket Arm Only for KL66. 10 inches long	KL89	.65●
Bracket Arm Only for KL67. 4⅝ inches long	KL3	.55●
Pipe Cross	HL6513	.85●
Ornamental Cap	HL6257	.25
Straight Nipple. 1¼-inch diameter x 2½ inches long	HL2894	.35
Set Screw, for nipple. ¼″–20 x ¼-inch long, headless, cup-point	HLS46502	.15★
1¼-Inch Conduit Check Nut	KL418	.10
1¼-Inch Pipe Check Nut	HL2379	.15
Lead Washer, for 1¼-inch pipe	HL6175	.10
Reducer. 1½ to 1¼ inches	KL424	.25
Pipe Tee, for bracket arm KL67	HL6487	.50
Insulating Bushing, for pipe tee	KL457	.25
Short Nipple, for pipe tee. 3 inches long	KL10	.35
Horizontal-Bracket Arm Complete, without wire outlet	KL14	13.60●
Horizontal-Bracket Arm Complete, with wire outlet	KL79	13.60●
Top and Bottom Arm without wire outlet. 43 inches long	KL13	1.80
Bottom Arm, for wire outlet. 37¾ inches long	KL78	1.80
Pipe Cross, with all openings threaded	HL6513	.75
Pipe Cross, with two openings threaded	KL433	1.00
Ornamental Cap	HL6257	.25
1¼-Inch Nipple. 5 inches long	KL415	.45
Straight Nipple, for outer arm. 2½ inches long	HL2894	.35
Straight Nipple, for inner arm. 3 inches long	KL10	.35
Set Screw, for nipples. ¼″–20 x ¼-inch long, headless, cup-point	HLS46502	.15★
1¼-Inch Conduit Check Nut	KL418	.10
1¼-Inch Pipe Check Nut	HL2379	.15
Lead Washer, for 1¼-inch pipe	HL6175	.10

For parts common to all signals, see section 610, pages 5 and 6. ★Per dozen. ●Denotes price change.

CROUSE-HINDS

Signal Replacement Parts

Parts for Four-Way Square Non-Adjustable Traffic Signals

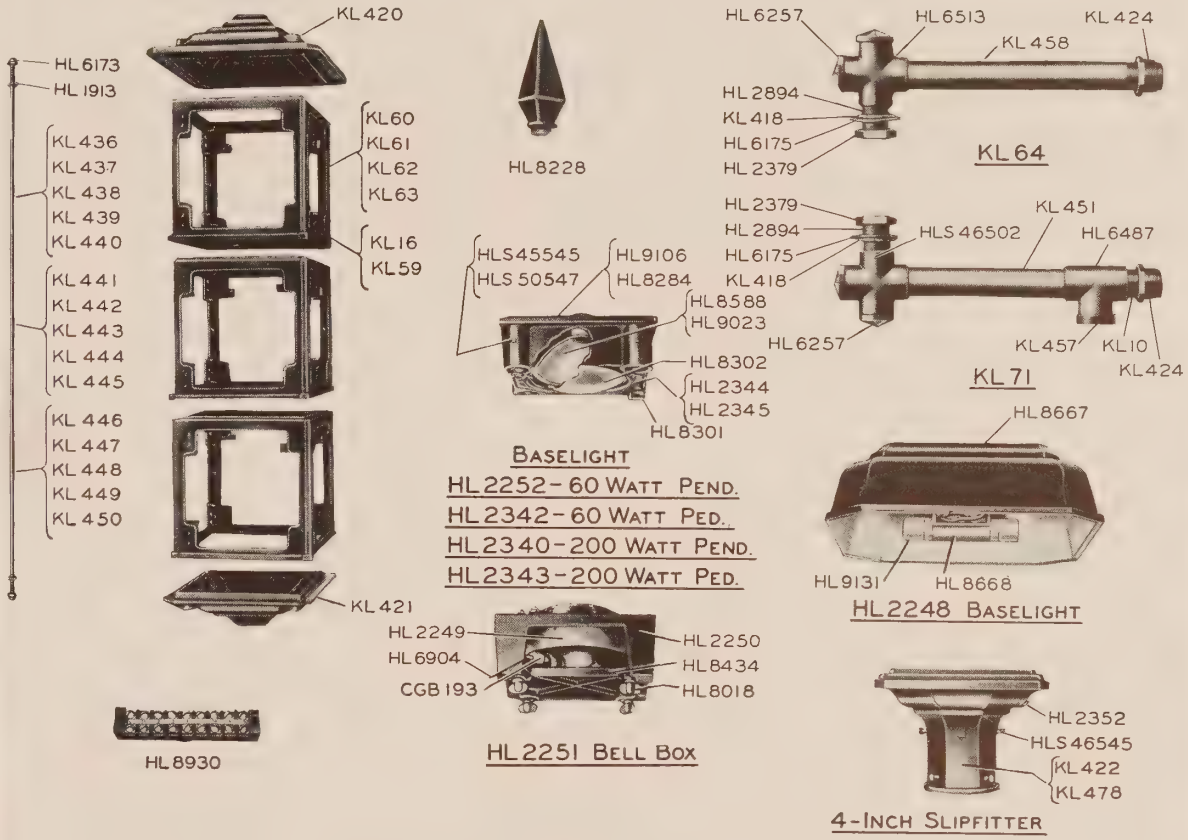


Fig. 1
Exploded View of Four-Way Non-Adjustable Signal Parts

Description	Cat. No.	List, each
Four-Way, One-Section Case Complete	KL63	$8.00
Three-Way, One-Section Case Complete	KL62	8.00
Two-Way (90°), One-Section Case Complete	KL60	8.00
Two-Way (180°), One-Section Case Complete	KL61	8.00
Plate Only, for door	KL16	1.80
Blank Plate Only	KL59	2.30
Ornamental Top	KL420	6.00•
Ornamental Bottom	KL421	4.00
9-Wire Connection Block	HL8930	2.00
Tie-Rods for All Signals Without Base Light or Bell Box		
Tie-Rod, for one-section signal. $14\frac{11}{16}$ inches long	KL436	.25
Tie-Rod, for two-section signal. $25\frac{9}{16}$ inches long	KL437	.30
Tie-Rod, for three-section signal. $36\frac{7}{16}$ inches long	KL438	.35
Tie-Rod, for four-section signal. $47\frac{5}{16}$ inches long	KL439	.40
Tie-Rod, for five-section signal. $58\frac{3}{16}$ inches long	KL440	.50

For parts common to all signals, see section 610, pages 5 and 6.
•Denotes price change.

CROUSE-HINDS

Signal Replacement Parts

Parts for Four-Way Square Non-Adjustable Traffic Signals

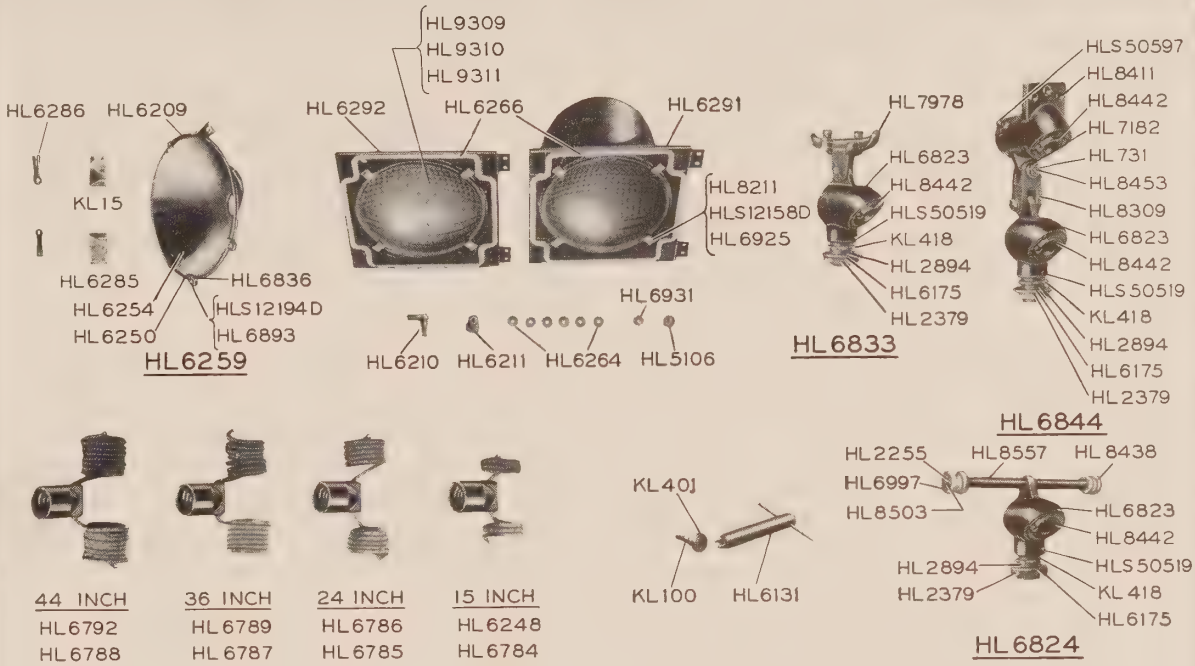
Description	Cat. No.	List, each
Tie-Rods for All Pendent Signals With Base Light or Bell Box		
Tie-Rod, for one-section signal. 13⅞ inches long	KL441	$ .25
Tie-Rod, for two-section signal. 24¾ inches long	KL442	.30
Tie-Rod, for three-section signal. 35⅝ inches long	KL443	.35
Tie-Rod, for four-section signal. 46½ inches long	KL444	.40
Tie-Rod, for five-section signal. 57⅜ inches long	KL445	.50
Tie-Rods for Type TIP Signals With Base Light and Slip Fitter		
Tie-Rod, for one-section signal. 15¼ inches long	KL446	.25
Tie-Rod, for two-section signal. 26⅛ inches long	KL447	.30
Tie-Rod, for three-section signal. 37 inches long	KL448	.35
Tie-Rod, for four-section signal. 47⅞ inches long	KL449	.40
Tie-Rod, for five-section signal. 58¾ inches long	KL450	.50
Ornamental Cap Nut, for tie-rods	HL6173	.25
Lock Washer, for cap nut. ⅜-inch, positive	HL1913	.15★
Ornamental Spearhead	HL8228	1.10
4-Inch Slip Fitter, for signals without base light	KL422	10.00●
4-Inch Slip Fitter, for signals with base light	KL478	10.00●
Porcelain Bushing, for slip fitter KL478	HL2352	.15
Set Screw, for slip fitter. ⅜″–16 x ½-inch long, headless, cup-point	HLS46545	.30★
Base Light Complete, for type TIP signal	HL2248	16.00●
Base Light Reflector Only	HL8667	12.00●
Receptacle Bracket	HL8668	.70
Screw, for fastening receptacle bracket to reflector. #12–24 x ½-inch long, R. H. steel	HLS11346	.15★
Lamp Receptacle, for TIP base light	HL9131	.60
Screw, for fastening lamp receptacle to bracket. #8–32 x ½-inch long, R. H. brass	HLS12162	.15★
60-Watt Base Light Complete, for suspended signals	HL2252	16.00●
60-Watt Base Light Complete, for pedestal signals (TSA)	HL2342	16.00●
200-Watt Base Light Complete, for suspended signals	HL2340	16.00●
200-Watt Base Light Complete, for pedestal signals (TSA)	HL2343	16.00●
Base Light Housing Only, for suspended signals	HL9106	9.00●
Base Light Housing Only, for pedestal signals (TSA)	HL8284	9.00●
Wood Plug, for housing HL9106	HL8445	.30
Set Screw, for housing HL9106. ⅜″–16 x ½-inch long, headless	HLS45545	.30★
Set Screw, for housing HLS284. ⅜″–16 x ¾-inch long, square	HLS50547	.30★
Reflector and Receptacle Assembly, for 60-watt base light	HL8588	4.20●
Reflector and Receptacle Assembly, for 200-watt base light	HL9023	5.60
Reflector Only, for 60-watt base light	HL8199	2.80●
Reflector Only, for 200-watt base light	HL8720	3.40●
Clear, Prismatic Diffusing Lens	HL8302	2.00●
Door Frame with Hinges, for base light HL2252	HL2344	1.70
Door Frame with Hinges, for base light HL2342	HL2345	1.25
Door Catch	HL8301	.60
Bell Box Complete with Bell	HL2251	46.00●
8-Inch Monitor Type Bell	HL2249	28.00●
Bell Box Only with Binding Posts	HL2250	9.00●
Support Plate, for bell HL2249	HL8434	4.00●
Thumb Screw. ⅜″–16, bronze	HL8018	.12
Two-Conductor Round "Supercord", No. 14 B & S—(Per foot)	HL6904	.15
Cable Connector	CGB193	.75
Bracket Arm Complete, without wire outlet	KL64	3.00●
Bracket Arm Complete, with wire outlet	KL71	3.00●
Bracket Arm only, for KL64. 16⅝ inches long	KL458	.85●
Bracket Arm only, for KL71. 11⅜ inches long	KL451	.70●
Pipe Cross	HL6513	.85●
Ornamental Cap	HL6257	.25
Straight Nipple. 1¼ inches diameter x 2½ inches long	HL2894	.35
Set Screw, for nipple. ¼″–20 x ¼-inch long, headless, cup-point	HLS46502	.15★
1¼-Inch Conduit Check Nut	KL418	.10
1¼-Inch Pipe Check Nut	HL2379	.15
Lead Washer, for 1¼-inch pipe	HL6175	.10
Reducer. 1½ to 1¼ inches	KL424	.25
Pipe Tee, for bracket arm KL71	HL6487	.50
Insulating Bushing, for pipe tee	KL457	.25
Short Nipple, for pipe tee. 3 inches long	KL10	.35

For parts common to all signals, see section 610, pages 5 and 6.
★Per dozen. ●Denotes price change.

CROUSE-HINDS

Signal Replacement Parts

Parts Common to All Traffic Signals



44 INCH	36 INCH	24 INCH	15 INCH
HL6792	HL6789	HL6786	HL6248
HL6788	HL6787	HL6785	HL6784
HL6791	HL6263	HL6262	HL6790
KL23	KL22	KL21	KL20

Fig. 1
Exploded View of Parts Common to All Signals

Description	Cat. No.	List, each
Reflector Assembly Complete, less receptacle	HL6259	$4.20•
Reflector Only	HL6254	2.80•
Cork Gasket, for reflector	HL6250	.30★
Reflector Support	HL6209	1.40•
Clip, for reflector	HL6836	.30★
Screw, for clip. #10–32 x ⅜-inch long, R. H. brass. Cadmium	HLS12194D	.24★
Lock Washer, for screw. #10 positive, steel	HL6893	.15★
Locking Clip, for reflector assembly	KL72	.10★
Rivet for Locking Clip	8025-N	.15★
Top Hinge Piece, for reflector assembly	KL15	.15
Bottom Hinge Piece, for reflector assembly	HL6285	.15
Cotter Pin, for hinge pieces	HL6286	.15★
Receptacle for red lens, with 44-inch leads	HL6792	.60
Receptacle for red lens, with 36-inch leads	HL6789	.60
Receptacle for red lens, with 24-inch leads	HL6786	.60
Receptacle for red lens, with 15-inch leads	HL6248	.60
Receptacle for amber lens, with 44-inch leads	HL6788	.60
Receptacle for amber lens, with 36-inch leads	HL6787	.60
Receptacle for amber lens, with 24-inch leads	HL6785	.60
Receptacle for amber lens, with 15-inch leads	HL6784	.60
Receptacle for green lens, with 44-inch leads	HL6791	.60
Receptacle for green lens, with 36-inch leads	HL6263	.60
Receptacle for green lens, with 24-inch leads	HL6262	.60
Receptacle for green lens, with 15-inch leads	HL6790	.60
Receptacle for arrow lens, with 44-inch leads	KL23	.60
Receptacle for arrow lens, with 36-inch leads	KL22	.60
Receptacle for arrow lens, with 24-inch leads	KL21	.60
Receptacle for arrow lens, with 15-inch leads	KL20	.60

★Per dozen. •Denotes price change.

CROUSE-HINDS

Signal Replacement Parts

Parts Common to All Traffic Signals

Description	Cat. No.	List, each
Door Complete with Hood and Red Combination Lens	HL6347	$6.00
Door Complete with Hood and Amber Combination Lens	HL6348	6.00
Door Complete with Hood and Green Combination Lens	HL6349	6.00
Door Complete with Hood and Arrow Lens	HL6360	7.00•
Door Complete less Hood, with Red Combination Lens	HL6362	6.00•
Door Complete less Hood, with Amber Combination Lens	HL6363	6.00•
Door Complete less Hood, with Green Combination Lens	HL6364	6.00•
Door Complete less Hood, with Arrow Lens	HL6375	7.00•
Door Frame with Hood, Complete with Hinges	HL6291	3.50
Door Frame less Hood, Complete with Hinges	HL6292	3.50•
Combination Lens, Red	HL9310	2.00
Combination Lens, Amber	HL9309	2.00
Combination Lens, Green	HL9311	2.00•
Lens Gasket, cork	HL6540	.15
Clip, for fastening lens	HL8211	.30★
Screw, for clip. #8–32 x ¼-inch long, R. H. brass, cadmium plated	HLS12158D	.15★
Lock Washer, for screw. #8 positive, steel	HL6925	.15★
Door Gasket	HL6266	.15
Door Catch Handle	HL6210	.20
Door Catch Cam	HL6211	.20
Spacing Washer, for cam	HL6264	.15★
Nut, for handle. ¼″–20, hex., brass, Cadmium	HL5106	.30★
Lock Washer, for nut. ¼-inch, positive, steel	HL6931	.24★
Special Locking Bolt	KL100	.50
Guard, for special locking bolt	KL401	.10
Wrench, for special locking bolt	HL6131	.50
Mast-Arm Hanger Complete	HL6844	8.60•
Mast-Arm Hanger Only	HL8411	4.10•
Set Screw, for hanger. ½″–13 x ¾-inch long, square, cup-point	HLS50597	.48★
Cover, for hanger. Includes fastening screws	HL8442	.30
Universal Joint	HL8309	1.30•
Stud, for universal joint	HL8453	.30
Nut, for stud. ½″–13 hex., brass	HL731	.12
Lock Washer, for nut. ½-inch, positive, steel	HL7182	.15★
Wire Outlet	HL6823	2.00•
Cover, for wire outlet. Includes fastening screws	HL8442	.30
1¼-Inch Straight Nipple. 2½ inches long	HL2894	.35
Set Screw, for nipple. 5/16″–18 x ½-inch long, square, cup-point	HLS50519	.30★
1¼-Inch Conduit Check Nut	KL418	.10
1¼-Inch Pipe Check Nut	HL2379	.15
Lead Washer, for 1¼-inch pipe	HL6175	.10
Span-Wire Hanger Complete	HL6833	4.00•
Clamp complete with bolts, rivet, and cotter pin	HL7978	1.70
Wire Outlet	HL6823	2.00•
Cover, for wire outlet. Includes fastening screws	HL8442	.30
1¼-Inch Straight Nipple. 2½ inches long	HL2894	.35
Set Screw, for nipple. 5/16″–18 x ½-inch long, square, cup-point	HLS50519	.30★
1¼-Inch Conduit Check Nut	KL418	.10
1¼-Inch Pipe Check Nut	HL2379	.15
Lead Washer, for 1¼-inch pipe	HL6175	.10
Overhead Feed Attachment Complete	HL6824	4.60•
Wire Outlet	HL6823	2.40•
Cover, for wire outlet. Includes fastening screws	HL8442	.30
1¼-Inch Straight Nipple. 2½ inches long	HL2894	.35
Set Screw, for nipple. 5/16″–18 x ½-inch long, square, cup-point	HLS50519	.30★
1¼-Inch Conduit Check Nut	KL418	.10
1¼-Inch Pipe Check Nut	HL2379	.15
Lead Washer, for 1¼-inch pipe	HL6175	.10
Spreader Arm	HL8503	.30
Spacer	HL8557	.25
Porcelain Insulator	HL8438	.10
Cotter Pin. 3/32-inch diameter x 1-inch long	HL6997	.15★
Washer, for cottor pin	HL2255	.15★

★Per dozen. •Denotes price change.

CROUSE-HINDS

Signal Replacement Parts

Parts for Signal Pedestal

With Fixed Cover Base

Fig. 1
HL2367 Base Complete with Support Legs and Fixed Cover Base for TSA Signals

Description	Cat. No.	List, each
Base Complete with Support Legs	HL2367	$104.00•
Pipe Support Legs	HL8281	1.50
Ball Ornament	HL2373	.35
Cover, for base	HL8279	7.50
Cap Screw. 3/8"–16 x 1½ inches long, hex., brass	HLS43553	.10
Asbestos Gasket. 3/8-inch square x 68 inches long	HL8564	1.00
Set Screw. 3/8"–16 x 1¾ inches long, square head, cup-point, steel	HLS50555	.10
Base Casting	HL8278	70.00•
"DRIVE TO RIGHT" Sign	HL8366	1.50
Screw. No. 8–32 x 5/16-inch long, R. H. brass	HLS12159	.15★
Cap Nut. 5/8"–11, brass	HL8280	.25
60-Watt Base Light, for pedestal beacons	HL2342	14.30

★Per dozen. •Denotes price change.

CROUSE-HINDS

Signal Replacement Parts

Parts for Signal Pedestal

With Hinged Cover Base

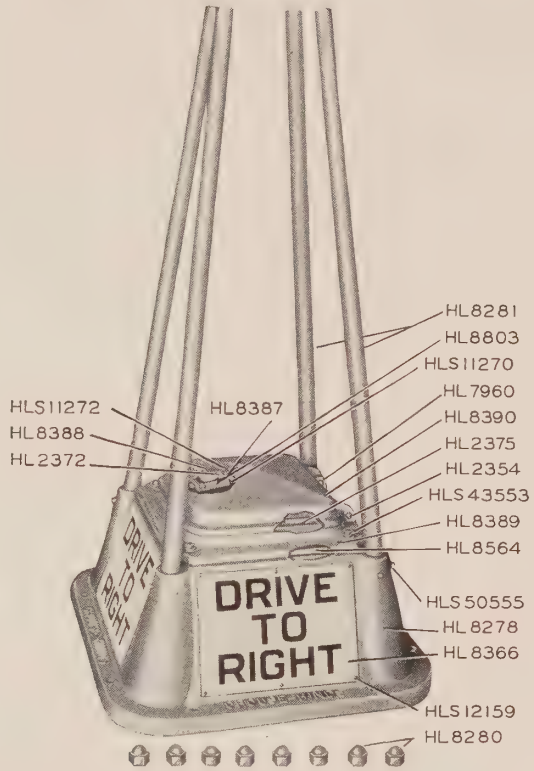


Fig. 2
HL2366 Base Complete with Support Legs and Hinged Cover Base for TSA Signals

Description	Cat. No.	List, each
Base Complete with Support Legs	HL2366	$104.00•
Pipe Support Legs	HL8281	1.50
Male Lock	HL8803	3.50
Key, for male lock	HL8804	.40
Screw. #10–24 x ⅜-inch long, R. H. steel	HLS11270	.15★
Nut. 5/16″–18 hex., brass	HL7960	.15
Hand Hole Cover	HL8390	4.20
Asbestos Gasket. ⅜-inch dia. x 52 inches long	HL2375	1.00
Hinge Pin, for base of TSA signals	HL2354	.20
Cap Screw. ⅜″–16 x 1½ inches long, hex., brass	HLS43553	.10
Hand Hole Cover Frame, for TSA signals	HL8389	7.50
Asbestos Gasket. ⅜-inch square x 68 inches long	HL8564	1.00
Set Screw. ⅜″–16 x 1¾ inches long, square head, cup-point, steel	HLS50555	.10
Base Casting	HL8278	70.00•
"DRIVE TO RIGHT" Signs	HL8366	1.50
Screw. #8–32 x 5/16-inch long, R. H. brass	HLS12159	.15★
Cap Nut. ⅝″–11, brass	HL8280	.25
Hinge, for key hole cover	HL8387	.25
Screw. #10–24 x ½-inch long, R. H. steel	HLS11272	.15★
Key Hole Cover	HL8388	.30
Hinge Pin. ⅛-inch dia. x 1¾ inches long, brass	HL2372	.10
Cradle, for automatic variable timing switch	HL8942	4.00
60-Watt Base Light Complete, for pedestal signals	HL2342	14.30

★Per dozen. •Denotes price change.

CROUSE-HINDS

Pipe Arm Assemblies

For Two, Three, Four, Five, and Six-Way Adjustable Signals

No. of Faces		2-Way		3-Way		4-Way		5-Way		6-Way	
Type of Support		Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
TRW	Cat. No.	KL402	HL6862	KL7	KL412	HL6499	KL408	HL6481	KL411	KL413	HL6483
	Page	10	10	10	10	11	11	12	12	12	12
	Fig. No.	1	2	11	12	6	7	13	14	16	17
TIRW	Cat. No.	KL402	KL2	KL7	KL6	HL6499	KL1	HL6481	HL6482	KL413	HL6484
	Page	10	10	10	10	11	11	12	12	12	12
	Fig. No.	1	8	11	13	6	8	13	15	16	18
TRM	Cat. No.	KL402	HL6862	KL7	KL412	HL6499	KL408	HL6481	KL411	KL413	HL6483
	Page	10	10	10	10	11	11	12	12	12	12
	Fig. No.	1	2	11	12	6	7	13	14	16	17
TIRM	Cat. No.	KL402	KL2	KL7	KL6	HL6499	KL1	HL6481	HL6482	KL413	HL6484
	Page	10	10	10	10	11	11	12	12	12	12
	Fig. No.	1	8	11	13	6	8	13	15	16	18
TRV	Cat. No.	KL405	KL405	KL56	KL56	KL410	KL410	Not	Not	Not	Not
	Page	10	10	11	11	11	11	Made	Made	Made	Made
	Fig. No.	3	3	1	1	9	9				
TRV	Cat. No.	KL405	KL1792	KL56	KL1793	KL410	KL1794	Not	Not	Not	Not
Wire Outlet	Page	10	10	11	11	11	11	Made	Made	Made	Made
in Lower Arm	Fig. No.	3	3	1	1	9	9				
TTV	Cat. No.	KL414	KL414	Not	Not	Not	Not	Not	Not	Not	Not
	Page	10	10	Made	Made	Made	Made	Made	Made	Made	Made
	Fig. No.	4	4								
TTV	Cat. No.	KL414	KL1716	Not	Not	Not	Not	Not	Not	Not	Not
Wire Outlet	Page	10	10	Made	Made	Made	Made	Made	Made	Made	Made
in Lower Arm	Fig. No.	4	5								
TRP	Cat. No.	HL6514	HL6512	KL406	HL6506	KL409	HL6507	KL411	HL6482	HL6483	HL6484
UG Feed	Page	10	10	11	11	12	12	12	12	12	12
	Fig. No.	6	7	2	3	10	11	14	15	17	18
TRP	Cat. No.	KL4	HL6512	HL6498	HL6506	HL6499	HL6507	HL6481	HL6482	KL413	HL6484
OH Feed	Page	10	10	11	11	11	12	12	12	12	12
	Fig. No.	9	7	4	3	6	11	13	15	16	18
TIRP	Cat. No.	KL402	KL2	KL412	KL6	KL409	KL1	KL411	HL6482	HL6483	HL6484
UG Feed	Page	10	10	10	10	12	11	12	12	12	12
	Fig. No.	1	8	12	13	10	8	14	15	17	18
TIRP	Cat. No.	KL402	KL2	KL7	KL6	HL6499	KL1	HL6481	HL6482	KL413	HL6484
OH Feed	Page	10	10	10	10	11	11	12	12	12	12
	Fig. No.	1	8	11	13	6	8	13	15	16	18
TRU	Cat. No.	HL6514	KL57	KL406	KL94	KL409	KL96	Not	Not	Not	Not
UG Feed	Page	10	10	11	11	12	12	Made	Made	Made	Made
	Fig. No.	6	10	2	5	10	12				
TRU	Cat. No.	KL4	KL57	HL6498	KL94	HL6499	KL96	Not	Not	Not	Not
OH Feed	Page	10	10	11	11	11	12	Made	Made	Made	Made
	Fig. No.	9	10	4	5	6	12				
TRA	Cat. No.	KL402	KL2	KL412	KL6	KL409	KL1	KL411	HL6482	HL6483	HL6484
UG Feed	Page	10	10	10	10	12	11	12	12	12	12
	Fig. No.	1	8	12	13	10	8	14	15	17	18
TRA	Cat. No.	KL402	KL2	KL7	KL6	HL6499	KL1	HL6481	HL6482	KL413	HL6484
OH Feed	Page	10	10	10	10	11	11	12	12	12	12
	Fig. No.	1	8	11	13	6	8	13	15	16	18

Bracket Arms

For One and Four-Way Non-Adjustable Signals

Used on	Page	Fig. No.
TSH–112D without Wire Outlet	13	1
TSH–113D without Wire Outlet	13	1
TSH–114D without Wire Outlet	13	1
TSH–112D with Wire Outlet	13	2
TSH–113D with Wire Outlet	13	2
TSH–114D with Wire Outlet	13	2

Used On	Page	Fig. No.
TSV–113D without Wire Outlet	13	3
TSV–113D with Wire Outlet	13	4
TSV–443D without Wire Outlet	13	5
TSV–443D with Wire Outlet	13	6

CROUSE-HINDS

Pipe Arm Assemblies

For Two and Three-Way Adjustable Signals

For Two-Way Signals

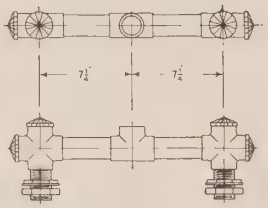


Fig. 1
Cat. No. KL402

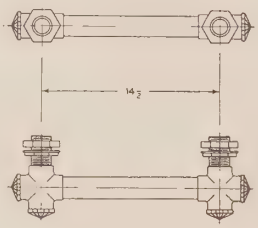


Fig. 2
Cat. No. HL6862

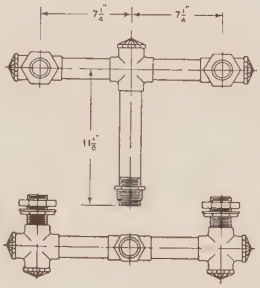


Fig. 3
Cat. No. KL405 Without Wire Outlet
Cat. No. KL1792 With Wire Outlet

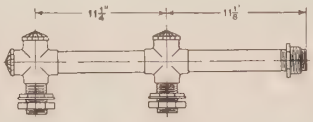


Fig. 4
Cat. No. KL414

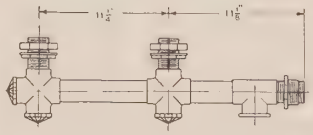


Fig. 5
Cat. No. KL1716

For Two-Way Signals—Cont'd

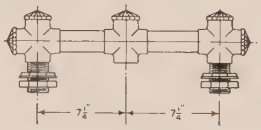


Fig. 6
Cat. No. HL6514

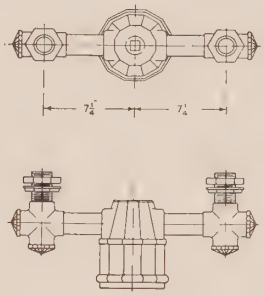


Fig. 7
Cat. No. HL6512

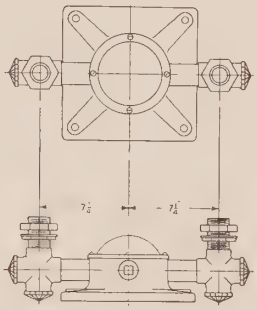


Fig. 8
Cat. No. KL2

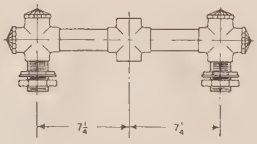


Fig. 9
Cat. No. KL4

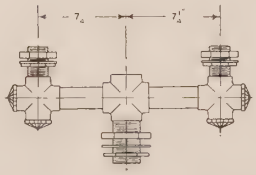


Fig. 10
Cat. No. KL57

For Three-Way Signals

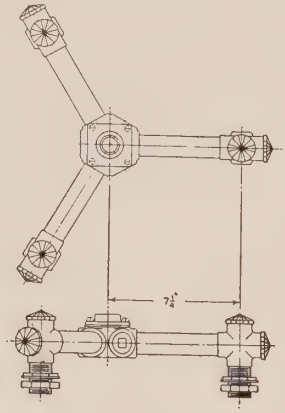


Fig. 11
Cat. No. KL7

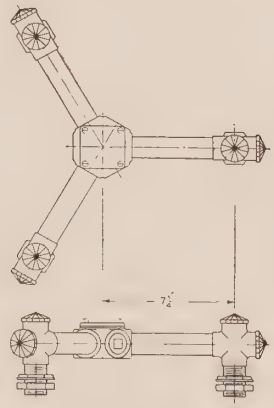


Fig. 12
Cat. No. KL412

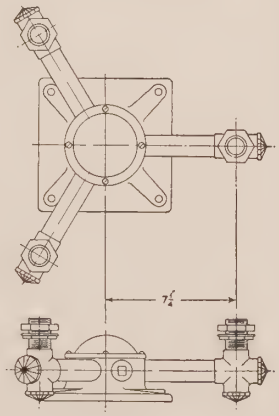


Fig. 13
Cat. No. KL6

CROUSE-HINDS

Pipe Arm Assemblies

For Three and Four-Way Adjustable Signals

For Three-Way Signals—Cont'd

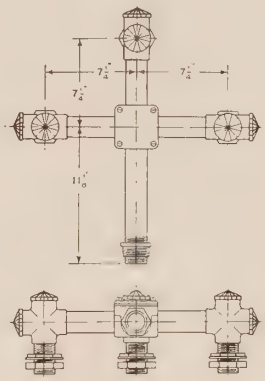


Fig. 1
Cat. No. KL56 Without Wire Outlet
Cat. No. KL1793 With Wire Outlet

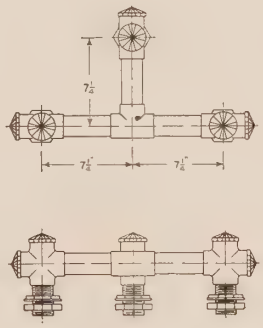


Fig. 2
Cat. No. KL406

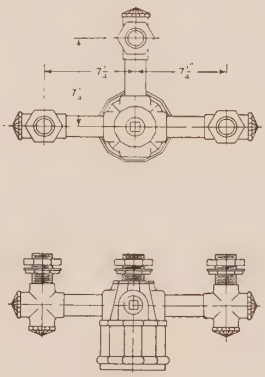


Fig. 3
Cat. No. HL6506

For Three-Way Signals—Cont'd

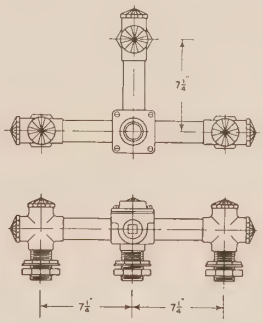


Fig. 4
Cat. No. HL6498

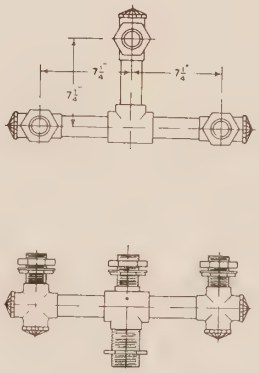


Fig. 5
Cat. No. KL94

For Four-Way Signals

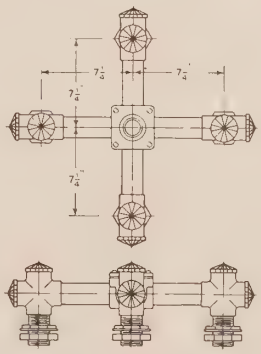


Fig. 6
Cat. No. HL6499

For Four-Way Signals—Cont'd

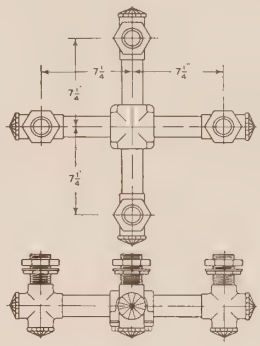


Fig. 7
Cat. No. KL408

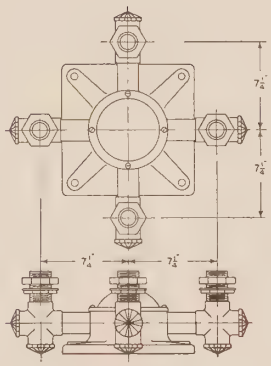


Fig. 8
Cat. No. KL1

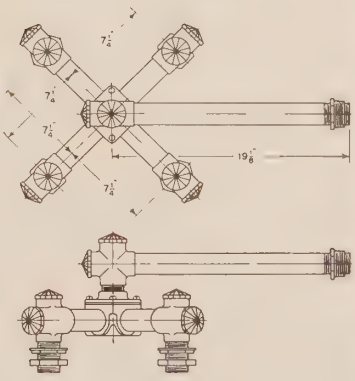


Fig. 9
Cat. No. KL410 Without Wire Outlet
Cat. No. KL1794 With Wire Outlet

CROUSE-HINDS

Pipe Arm Assemblies

For Four, Five, and Six-Way Adjustable Signals

For Four-Way Signals—Cont'd

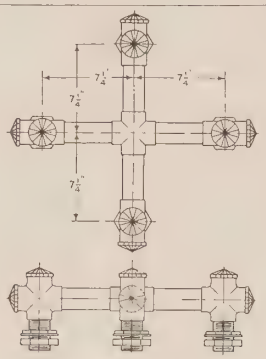


Fig. 10
Cat. No. KL409

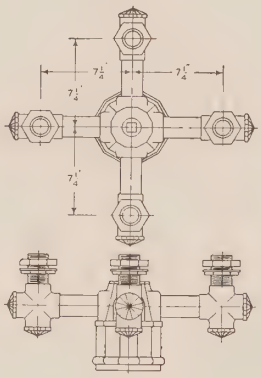


Fig. 11
Cat. No. HL6507

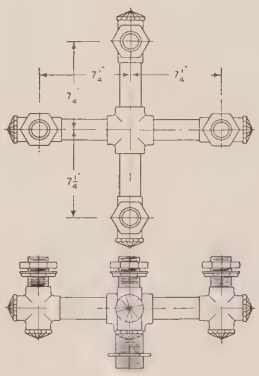


Fig. 12
Cat. No. KL96

For Five-Way Signals

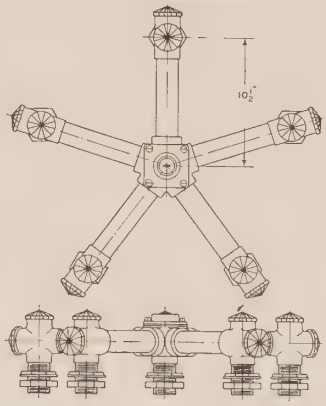


Fig. 13
Cat. No. HL6481

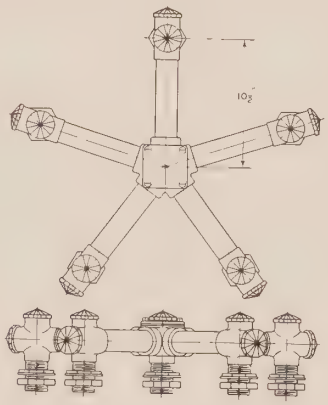


Fig. 14
Cat. No. KL411

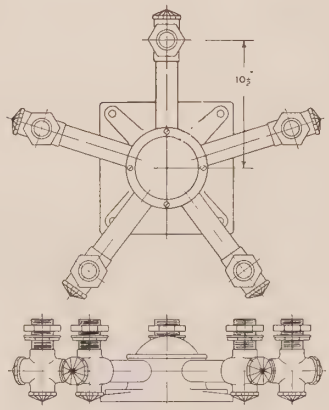


Fig. 15
Cat. No. HL6482

For Six-Way Signals

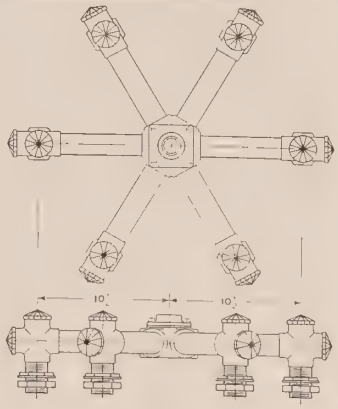


Fig. 16
Cat. No. KL413

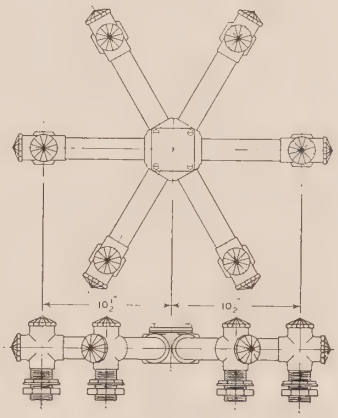


Fig. 17
Cat. No. HL6483

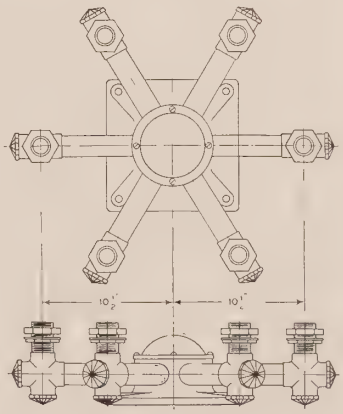


Fig. 18
Cat. No. HL6484

CROUSE-HINDS

Bracket Arms

For One and Four-Way Non-Adjustable Signals

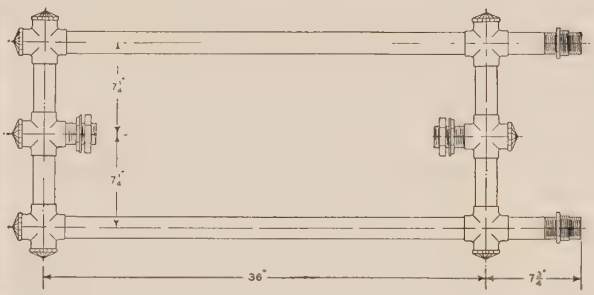


Fig. 1
Cat. No. KL14 for Three-Section Signals
Cat. No. KL73 for Two-Section Signals
Cat. No. KL74 for Four-Section Signals

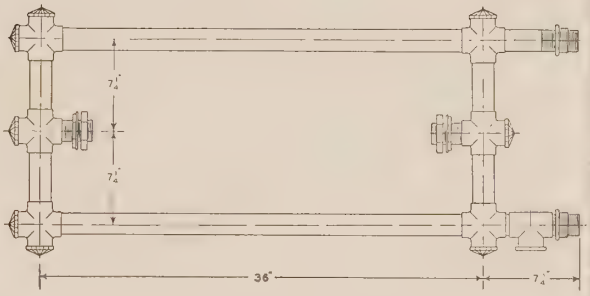


Fig. 2
Cat. No. KL79 for Three-Section Signals
Cat. No. KL1795 for Two-Section Signals
Cat. No. KL1796 for Four-Section Signals

Note: The 36-inch dimensions given above are for three-section signals. These dimensions are 26 inches for two-section signals and 46 inches for four-section signals.

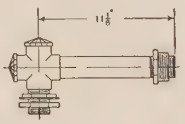


Fig. 3
Cat. No. KL66

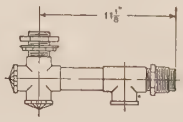


Fig. 4
Cat. No. KL67

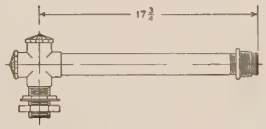


Fig. 5
Cat. No. KL64

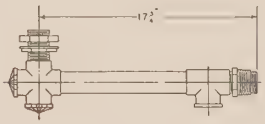


Fig. 6
Cat. No. KL71

Pipe Arm Assemblies and Bracket Arms

For One, Two, Three, Four, Five, and Six-Way Signals

Page No.	Fig. No.	Cat. No.	List, each★	Page No.	Fig. No.	Cat. No.	List, each★	Page No.	Fig. No.	Cat. No.	List, each★
12	13	HL6481	$17.50	10	11	KL7	$10.50	11	2	KL406	$10.50
12	15	HL6482	32.50	13	1	KL14	13.60	11	7	KL408	14.00
12	17	HL6483	21.00	11	1	KL56	13.50	12	10	KL409	14.00
12	18	HL6484	36.00	10	10	KL57	7.60	11	9	KL410	17.00
11	4	HL6498	10.50	13	5	KL64	3.00	12	14	KL411	17.50
11	6	HL6499	14.00	13	3	KL66	3.00	10	12	KL412	10.50
11	3	HL6506	15.50	13	4	KL67	3.00	12	16	KL413	21.00
12	11	HL6507	19.00	13	6	KL71	3.00	10	4	KL414	10.00
10	7	HL6512	12.00•	13	1	KL73	13.60	10	5	KL1716	10.00
10	6	HL6514	7.00	13	1	KL74	13.60	10	3	KL1792	10.00
10	2	HL6862	7.00	13	2	KL79	13.60	11	1	KL1793	13.50
11	8	KL1	29.00	11	5	KL94	11.10•	11	9	KL1794	17.00
10	8	KL2	22.00	12	12	KL96	14.60	13	2	KL1795	13.60
10	9	KL4	7.00	10	1	KL402	7.00	13	2	KL1796	13.60
10	13	KL6	25.50	10	3	KL405	10.00				

★The list prices cover pipe arm assemblies made of 1¼-inch pipe. If 2-inch pipe is required, add 50% to the list prices, and if 2-inch wrought iron pipe is required, add 100% to the list prices. •Denotes price change.

CROUSE-HINDS

Timer Replacement Parts

Principal Replacement Parts for All Timers

Fig. 1
Principal Replacement Parts for All Crouse-Hinds Timers

CROUSE-HINDS

Timer Replacement Parts

Principal Replacement Parts for All Timers

Description	Cat. No.	List, each
Disc and Shaft Complete, for type DA-21	3638-A	$1.75
Disc Only	3420-A	.20
Shaft and Pinion	1302-N	1.40•
Hub, for disc 3420-A	9220-N	.35
Set Screw, for hub 9220-N. #4–40 x 1/8-inch long, headless, cup-point	HLS46001	.15★
Lock Nut, for disc 3420-A	9222-N	.15
Disc and Shaft Complete, for types DLS, DSA-21, DSG-21, and DSG-2105	DSG3638-A	4.00
Disc Only	3499-A	2.50
Shaft and Pinion	1066-N2	1.65•
Hub, for disc 3499-A	9220-N	.65•
Set Screw, for hub 9220-N. #4-40 x 1/8-inch long, headless, cup-point	HLS46001	.15★
Lock Nut, for disc 3499-A	9222-N	.25•
Disc and Shaft, for types DF-21, DFM-21, GFM-2, and DL	5367-N	2.50
Shaft and Pinion (12-tooth)	5894-N	.65
Stationary Contact, Left-hand	10317-N	.30
Stationary Contact, Right-hand	10318-N	.30
Movable Contact, Single	10314-N	.30
Movable Contact, Double, for types DL, DLS, and DF-21	1933-N	.60
Movable Contact, Double, for types DA-21, DSA-21, DSG-21, and DSG-2105	1617-N	.60
Movable Contact, Double. Special	1901-N	2.50
Channel, for movable contacts	9995-N	.10
Screw, for movable contacts. #4–40 x 1/4-inch long, R. H. brass	HLS12003	.15★
Follower Complete, for main contacts	5320-N	.50•
Follower Complete with Roller, for flashing contact	5404-N	.85•
Follower Only, for main contacts	5037-A	.40•
Follower Only, for flashing contact	5495-A	.40•
Roller for flashing contact	1003-N	.25
Pin for roller for flasher contact	1002-N	.05
Insulation Block, for follower	1270-N	.15
Shim for double contact	7003-N	.10
Screw, for insulation block. #4–40 x 1/4-inch, F. H. brass	HLS16003	.15★
Spring for contact arm	1618-N	.10
Trigger Arm, for all timers	5038-A	.50
Spring for trigger arm	1307-N	.10
Spacers, for followers	1004-N	.20•
Set Screw, for spacer #4–40 x 1/8-inch long, headless, cone-point	HLS45001	.15★
Ball Bearing, Complete with check nut. 3/4 inch long	1637-N	.75
Ball Bearing, Complete with check nut. 19/32 inch long	5276-N	.75
Oil Impregnated Bearing, Complete with check nut. 3/4 inch long. (For Disc Shaft)	3416-N•	.75•
Oil Impregnated Bearing, Complete with check nut. 19/32 inch long. (For Disc Shaft)	3874-N•	.75•
Ball Bearing Only. 3/4 inch long	5409-N	.60
Ball Bearing Only. 19/32 inch long	1799-N	.60
Oil Impregnated Bearing Only. 3/4 inch long. (For Disc Shaft)	3749-N•	.60•
Oil Impregnated Bearing Only. 19/32 inch long. (For Disc Shaft)	3873-N•	.60•
Check Nut, for all ball bearings	5318-N	.15•
Magnet Coil, for all timers. 110-volt, 60-cycle	1279-N	1.50
Bucking Coil, for "Trafflex" timers only, 110-volt, 60-cycle	5468-N	1.50
Main Feed Lead Complete	1792-N	.40
No. 1 Green-Amber Lead Complete	1793-N	.40
No. 2 Green-Amber Lead Complete	1794-N	.40
Wire Clip Only, for leads	8638-N	.05
Wire Lug Only, for leads	9632-N	.05

★Per dozen. •Denotes change in catalog number or price.

CROUSE-HINDS

Timer Replacement Parts

Parts for Type TSS-4 Manual Control Switches

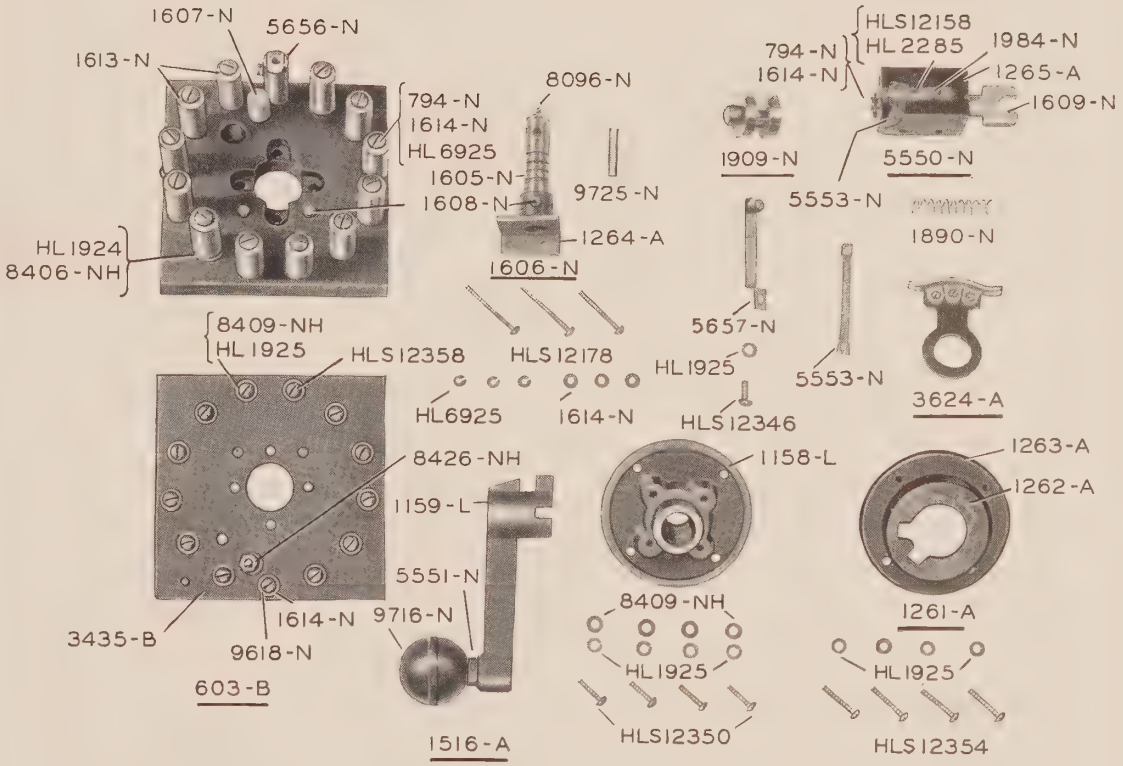


Fig. 1
Parts for Type TSS-4 Manual Control Switches

CROUSE-HINDS

Timer Replacement Parts

Parts for Type TSS-4 Manual Control Switches

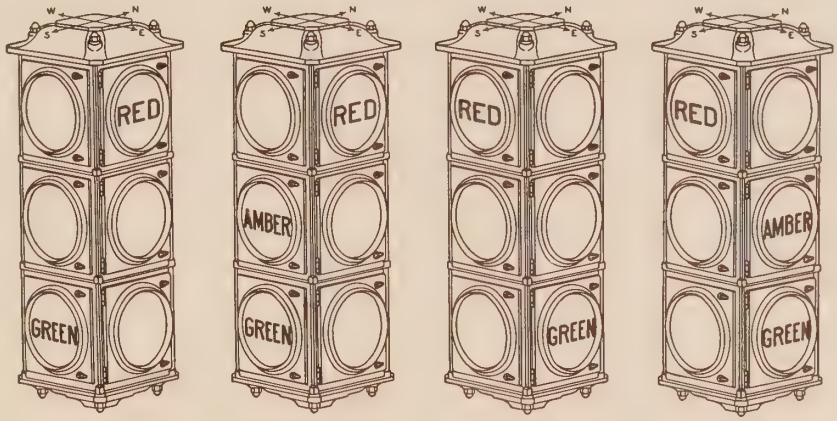
Description	Cat. No.	List, each
Base and Contacts Complete	603-B	$12.50
Composition Base Only	3435-B	.75
Feed Post, Brass	5656-N	.50
Contact Post, Bronze	1613-N	.25
Screw, for fastening posts 1613-N, 5656-N to base. #12–24 x 1¼ inches long, R. H. brass	HLS12358	.40★
Stop	1607-N	.40
Nut, for stop 1607-N	8426-NH	.15★
Washer, for screw HLS12358 and nut 8426-NH	8409-NH	.15★
Lock Washer, for screw HLS12358 and nut 8426-NH. #12 positive	HL1925	.15★
Lock Washer, for one contact post. 5/16 inch positive. #2 Red-N S. 8226N	HL1924	.15★
Washer, for one contact post	8406-NH	.48★
Binding Screw, for one contact post	794-N	.15★
Washer, for contact screw 794-N and nuts 345-N, 9618-N	1614-N	.15★
Lock Washer, for contact screw 794-N. #8 positive	HL6925	.15★
Pin, for interference cam stop	1608-N	.15
Shaft and Saddle	1606-N	2.40
Shaft Only	1605-N	1.20
Saddle Only	1264-A	.65
Pin for cam	1608-N	.15
Set Screw. #12–24 x ⅜ inch long, headless, dog-point	8096-N	.24★
Pin, for operating handle	9725-N	.15
Bearing, for shaft 1606-N	1158-L	2.00
Screws, for bearing 1158-L. #12–24 x ¾ inch long, R. H. brass	HLS12350	.30★
Dial and Guard	1261-A	3.10
Dial Only	1262-A	2.50
Guard Only	1263-A	.65
Drive Screw	No. 2 x ¼″	.15★
Screw, for dial and guard 1261-A. #12–24 x 1 inch long, R. H. brass	HLS12354	.24★
Washer, for screw HLS12350	8409-NH	.15★
Lock Washer, for screws HLS12350, 12354. #12 positive	HL1925	.15★
Insulating Block and Plunger Complete	5550-N	3.00
Plunger and Pin	1609-N	.65
Insulation Block	1265-A	.65
Contact Plate	1984-N	.10
Screw, for fastening plate 1984-N to block 1265-A. #8–32 x ¼ inch long, R. H. brass	HLS12158	.15★
Lock Washer, for screw HLS12158. #8 shakeproof	HLS2285	.15★
Binding Screw	794-N	.15★
Washer, for binding screw 794-N	1614-N	.15★
Braided Conductor	5553-N	.15
Plunger Spring	1890-N	.15
Screw, for fastening block and plunger 5550-N to saddle 1606-N. #8–32 x 1½ inches long, R. H. brass	HLS12178	.24★
Lock Washer, for screw HLS12178. #8 positive	HL6925	.15★
Washer, for screw HLS12178	1614-N	.15★
Nut. #8–32, 5/16 x 5/32 inch, Hex. brass	9618-N	.30★
Contact Spring and Button	5657-N	.50
Screw, for contact spring 5657-N. #12–24 x ½ inch long, R. H. brass	HLS12346	.24★
Lock Washer, for screw HLS12346. #12, positive	HL1925	.15★
Interference Cam Complete	3624-A	1.15
Contact Roller Complete	1909-N	.50
Operating Handle Complete	1516-A	1.60
Operating Handle, body only 1516-A	1159-L	1.10
Stud, for operating handle 1516-A	5551-N	.20
Ball, for operating handle 1516-A	9716-N	.20
Screw, for fastening steel to handle. #12–24 x ⅜ inch long, R. H. brass	HLS12344	.24★
Washer, for screw HLS12344. #12 brass	8226-N	.36★
Lock Washer, for screw HLS12344. #12 positive steel	HL1925	.15★

★Per dozen.

CROUSE-HINDS

Color Sequences

Three-Color Signals



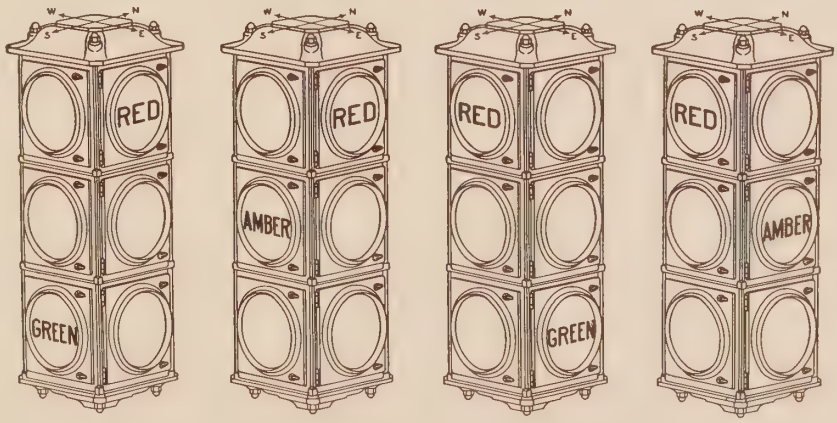
1 "GO" North—South ("STOP" East—West)

2 Change

3 "GO" East—West ("STOP" North—South)

4 Change

Fig. 1
Amber Period Overlapping Green Only
(Green-Amber Overlap)



1 "GO" North—South ("STOP" East—West)

2 Change

3 "GO" East—West ("STOP" North—South)

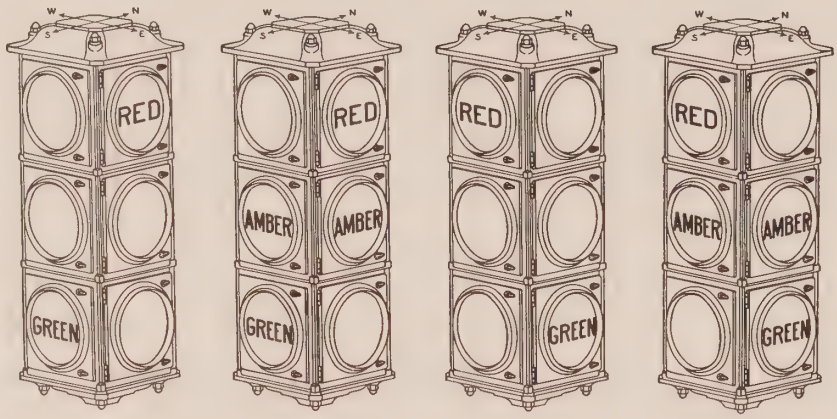
4 Change

Fig. 2
Amber Period Following Green Only
(Green-Amber Non-Overlap)

CROUSE-HINDS

Color Sequences

Three-Color Signals



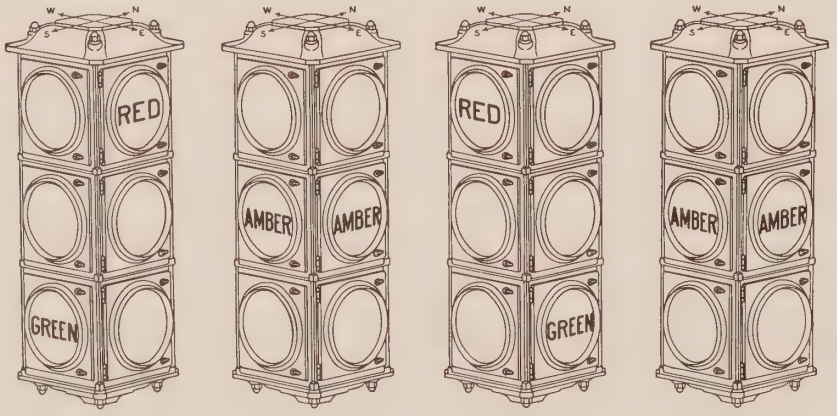
1 "GO" North—South ("STOP" East—West)

2 Change

3 "GO" East—West ("STOP" North—South)

4 Change

Fig. 3
All-Amber Period Overlapping Preceding Colors
(All-Amber Overlap)



1 "GO" North—South ("STOP" East—West)

2 Change

3 "GO" East—West ("STOP" North—South)

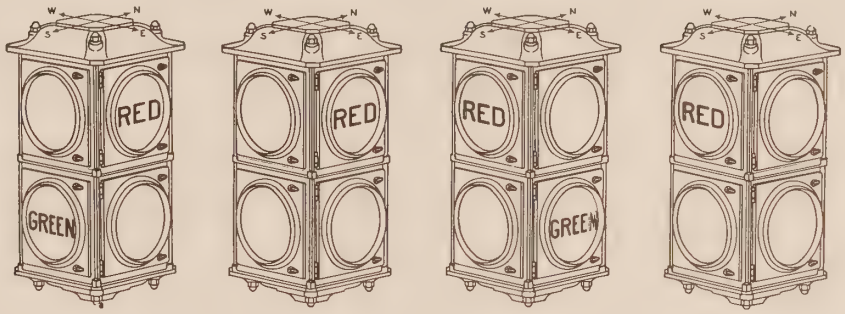
4 Change

Fig. 4
All-Amber Period Following Preceding Colors
(All-Amber Non-Overlap)

CROUSE-HINDS

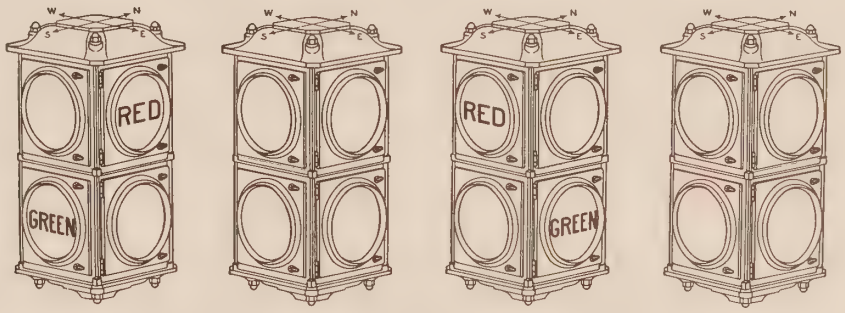
Color Sequences

Two-Color Signals



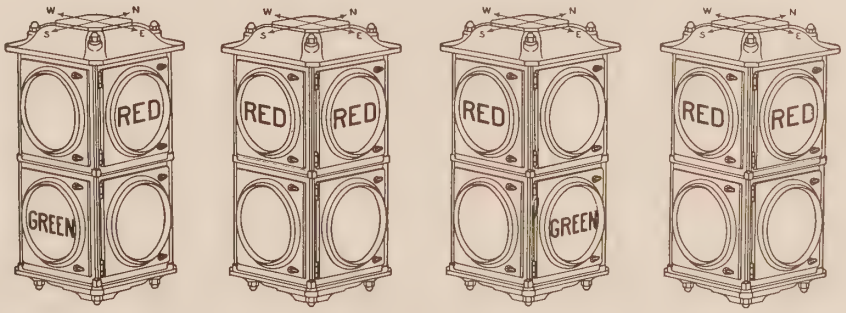
1 "GO" North—South ("STOP" East—West) | 2 Change | 3 "GO" East—West ("STOP" North—South) | 4 Change

Fig. 1
Dark Period Following Green Only



1 "GO" North—South ("STOP" East—West) | 2 Change | 3 "GO" East—West ("STOP" North—South) | 4 Change

Fig. 2
All-Dark Change Period



1 "GO" North—South ("STOP" East—West) | 2 Change | 3 "GO" East—West ("STOP" North—South) | 4 Change

Fig. 3
All-Red Change Period

CROUSE-HINDS

Fig. 4
Installation of Crouse-Hinds Traffic Signals

Fig. 5
Installation of Crouse-Hinds Traffic Signals

CROUSE-HINDS

Field Wiring for Automatic Timing Switches

Types DA-21, DSA-21, and DSG-21

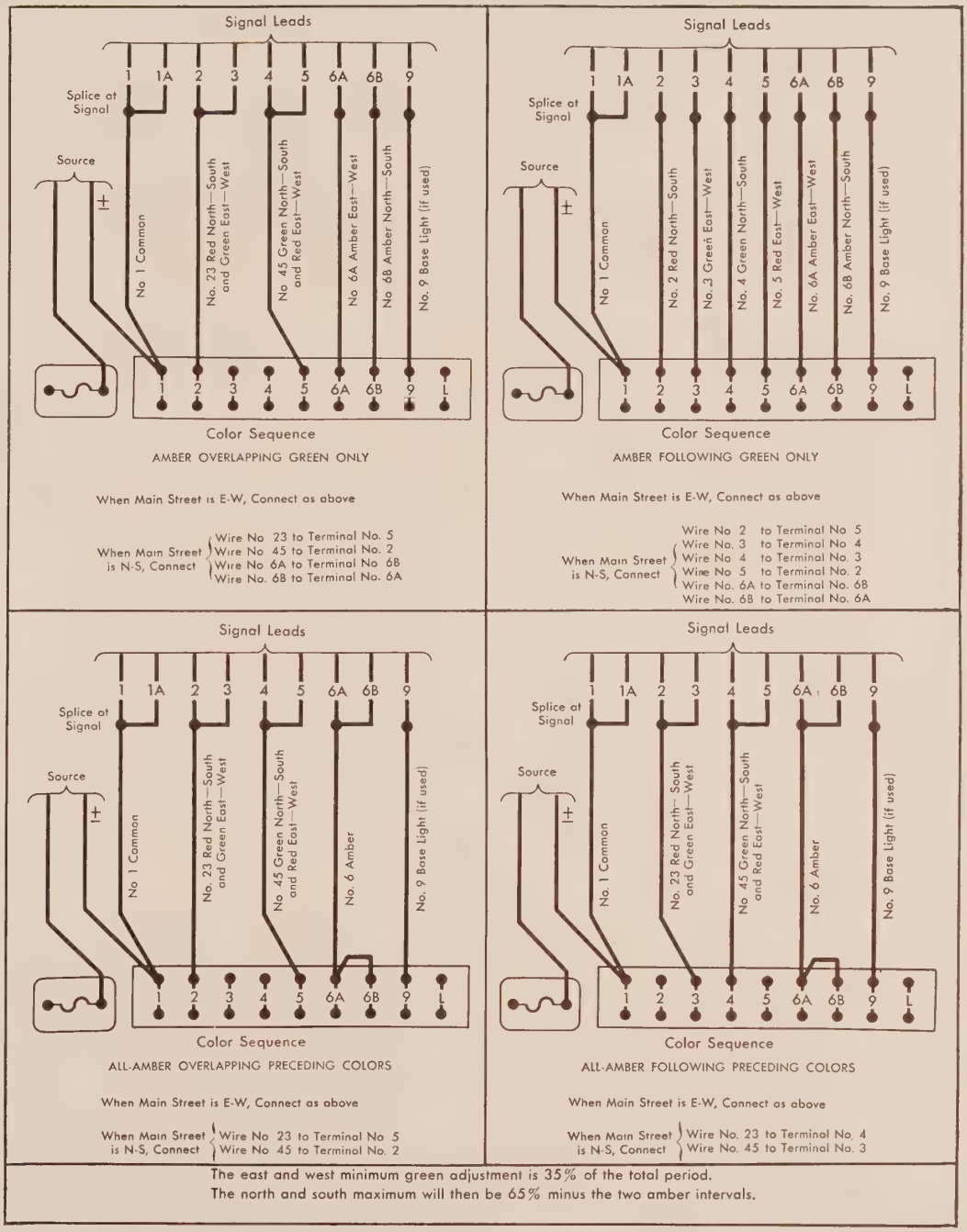

Signal Leads
1 1A 2 3 4 5 6A 6B 9
Splice at Signal
Source
1+
No 1 Common
No. 23 Red North—South and Green East—West
No 45 Green North—South and Red East—West
No 6A Amber East—West
No 6B Amber North—South
No. 9 Base Light (if used)
1 2 3 4 5 6A 6B 9 L
Color Sequence
AMBER OVERLAPPING GREEN ONLY
When Main Street is E-W, Connect as above
When Main Street is N-S, Connect
Wire No 23 to Terminal No. 5
Wire No 45 to Terminal No. 2
Wire No 6A to Terminal No 6B
Wire No. 6B to Terminal No. 6A
Signal Leads
1 1A 2 3 4 5 6A 6B 9
Splice at Signal
Source
1+
No 1 Common
No. 2 Red North—South
No. 3 Green East—West
No. 4 Green North—South
No. 5 Red East—West
No. 6A Amber East—West
No. 6B Amber North—South
No. 9 Base Light (if used)
1 2 3 4 5 6A 6B 9 L
Color Sequence
AMBER FOLLOWING GREEN ONLY
When Main Street is E-W, Connect as above
When Main Street is N-S, Connect
Wire No 2 to Terminal No 5
Wire No. 3 to Terminal No 4
Wire No 4 to Terminal No. 3
Wire No 5 to Terminal No. 2
Wire No. 6A to Terminal No. 6B
Wire No. 6B to Terminal No. 6A
Signal Leads
1 1A 2 3 4 5 6A 6B 9
Splice at Signal
Source
1+
No 1 Common
No. 23 Red North—South and Green East—West
No 45 Green North—South and Red East—West
No. 6 Amber
No. 9 Base Light (if used)
1 2 3 4 5 6A 6B 9 L
Color Sequence
ALL-AMBER OVERLAPPING PRECEDING COLORS
When Main Street is E-W, Connect as above
When Main Street is N-S, Connect
Wire No 23 to Terminal No 5
Wire No 45 to Terminal No. 2
Signal Leads
1 1A 2 3 4 5 6A 6B 9
Splice at Signal
Source
1+
No 1 Common
No. 23 Red North—South and Green East—West
No 45 Green North—South and Red East—West
No. 6 Amber
No. 9 Base Light (if used)
1 2 3 4 5 6A 6B 9 L
Color Sequence
ALL-AMBER FOLLOWING PRECEDING COLORS
When Main Street is E-W, Connect as above
When Main Street is N-S, Connect
Wire No. 23 to Terminal No. 4
Wire No. 45 to Terminal No. 3
The east and west minimum green adjustment is 35% of the total period.
The north and south maximum will then be 65% minus the two amber intervals.

Fig. 1
Field Wiring for Types DA-21, DSA-21, and DSG-21 Automatic Timing Switches

CROUSE-HINDS

Signal Wiring and Lead Identifications

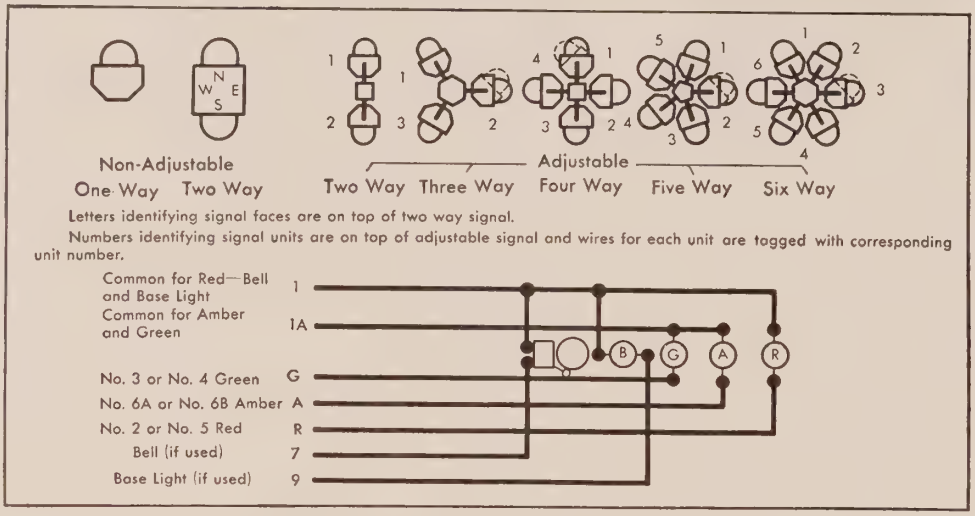


Fig. 2
Internal Wiring of One-Way, Adjustable and Non-Adjustable Signals

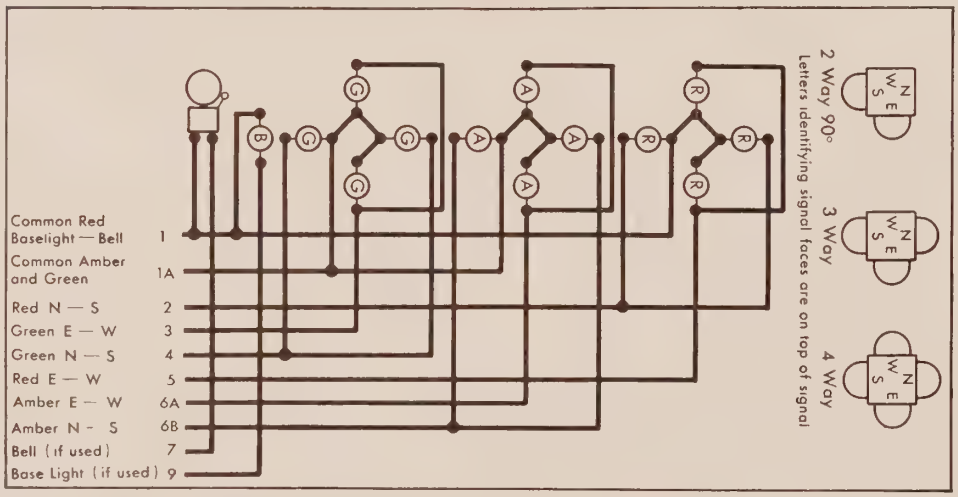


Fig. 3
Internal Wiring of Two, Three, and Four-Way, Non-Adjustable Signals

Connect Signal Lead

No. 1.....Common to control conductor No. 1
No. 1A.....Common to signal lead.....No. 1

For emergency all-red feature, connect signal lead No. 1A to control conductor No. 1A

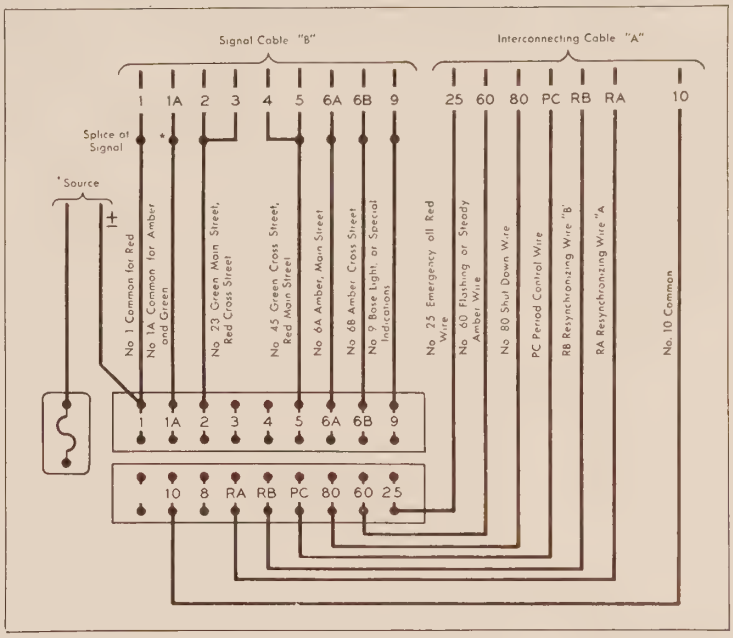
R.....From Signal facing North or South to Control Conductor No. 2 or No. 23
G.....From Signal facing East or West to Control Conductor No. 3 or No. 23
G.....From Signal facing North or South to Control Conductor No. 4 or No. 45
R.....From Signal facing East or West to Control Conductor No. 5 or No. 45
A.....From Signal facing East or West to Control Conductor No. 6A or No. 6
A.....From Signal facing North or South to Control Conductor No. 6B or No. 6
No. 7.....Bell to Control Conductor No. 7
No. 9.....Base Light to Control Conductor No. 9

See also diagram of field wiring for controls on pages 7 and 8.

CROUSE-HINDS

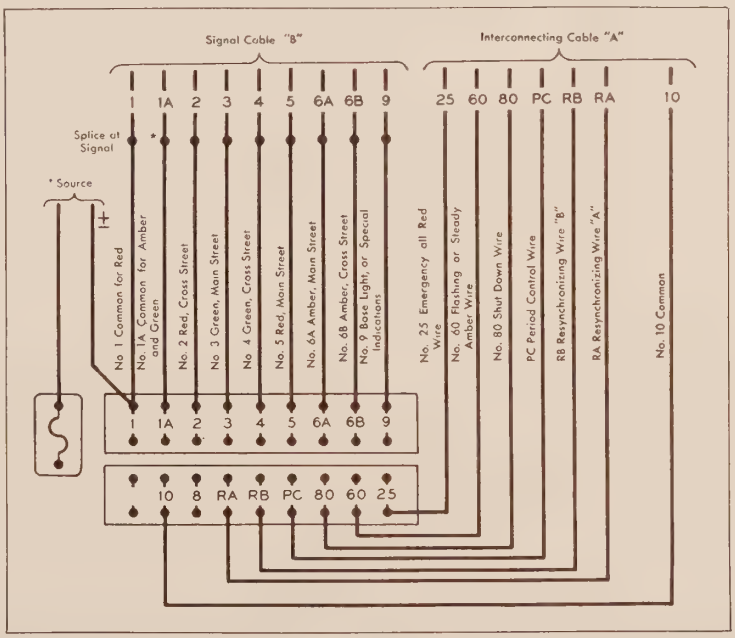
Field Wiring for Automatic Timing Switches

Type DF-21 "Trafflex" Secondary


Signal Cable "B"
Interconnecting Cable "A"
1 1A 2 3 4 5 6A 6B 9
25 60 80 PC RB RA 10
Splice at Signal
* Source
+
−
No 1 Common for Red
No 1A Common for Amber and Green
No 23 Green Main Street, Red Cross Street
No 45 Green Cross Street, Red Main Street
No 6A Amber, Main Street
No 6B Amber, Cross Street
No 9 Base Light, or Special Indications
No 25 Emergency all Red Wire
No 60 Flashing or Steady Amber Wire
No 80 Shut Down Wire
PC Period Control Wire
RB Resynchronizing Wire "B"
RA Resynchronizing Wire "A"
No 10 Common
1 1A 2 3 4 5 6A 6B 9
10 8 RA RB PC 80 60 25

★When emergency all-red is not ordered, connect Signal lead No. 1A to conductor No. 1 at Signal
*For 220-Volt, connect both wires at current supply to 2-pole cartridge fuse cutout located on side wall of cabinet

Fig. 1
Field Wiring for Type DF-21 "Trafflex" Secondary
Amber Period Overlapping Green Only


Signal Cable "B"
Interconnecting Cable "A"
1 1A 2 3 4 5 6A 6B 9
25 60 80 PC RB RA 10
Splice at Signal
* Source
+
−
No 1 Common for Red
No 1A Common for Amber and Green
No 2 Red, Cross Street
No 3 Green, Main Street
No 4 Green, Cross Street
No 5 Red, Main Street
No 6A Amber, Main Street
No 6B Amber, Cross Street
No 9 Base Light, or Special Indications
No 25 Emergency all Red Wire
No 60 Flashing or Steady Amber Wire
No 80 Shut Down Wire
PC Period Control Wire
RB Resynchronizing Wire "B"
RA Resynchronizing Wire "A"
No 10 Common
1 1A 2 3 4 5 6A 6B 9
10 8 RA RB PC 80 60 25

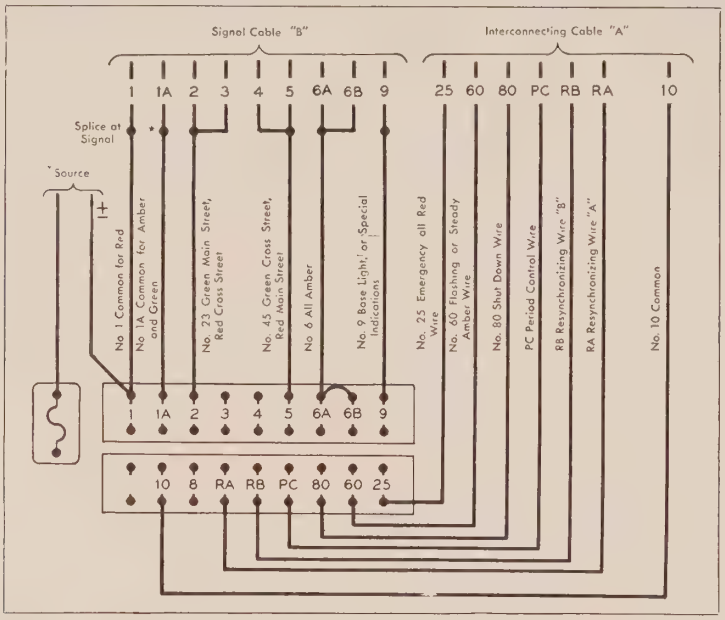
★When emergency all-red is not ordered, connect Signal lead No. 1A to conductor No. 1 at Signal
*For 220-Volt, connect both wires at current supply to 2-pole cartridge fuse cutout located on side wall of cabinet

Fig. 2
Field Wiring for Type DF-21 "Trafflex" Secondary
Amber Period Following Green Only

CROUSE-HINDS

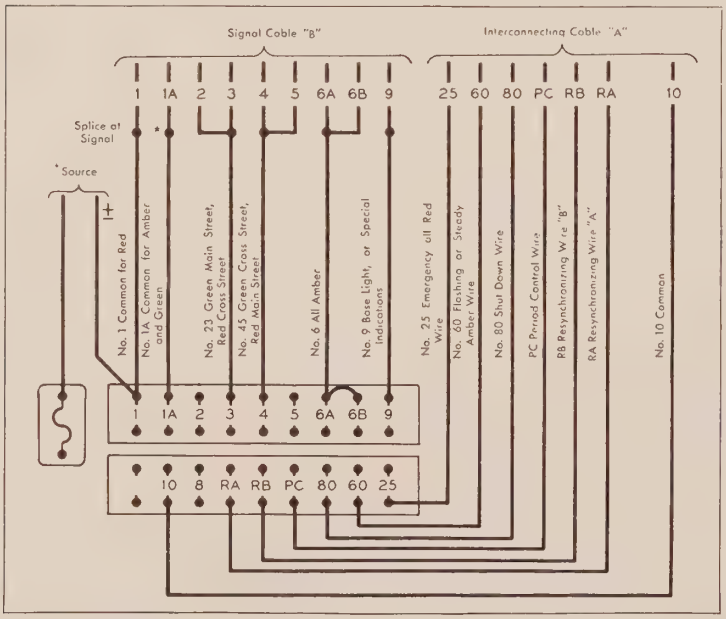
Field Wiring for Automatic Timing Switches

Type DF-21 "Trafflex" Secondary


Signal Cable "B"
Interconnecting Cable "A"
1 1A 2 3 4 5 6A 6B 9
25 60 80 PC RB RA 10
Splice at Signal
*Source
1+
No. 1 Common for Red
No. 1A Common for Amber and Green
No. 23 Green Main Street, Red Cross Street
No. 45 Green Cross Street, Red Main Street
No. 6 All Amber
No. 9 Base Light, or Special Indications
No. 25 Emergency all Red Wire
No. 60 Flashing or Steady Amber Wire
No. 80 Shut Down Wire
PC Period Control Wire
RB Resynchronizing Wire "B"
RA Resynchronizing Wire "A"
No. 10 Common
1 1A 2 3 4 5 6A 6B 9
10 8 RA RB PC 80 60 25

★When emergency all-red is not ordered, connect Signal lead No. 1A to conductor No. 1 at Signal
*For 220-Volt, connect both wires at current supply to 2-pole cartridge fuse cutout located on side wall of cabinet

Fig. 3
Field Wiring for Type DF-21 "Trafflex" Secondary
All-Amber Period Overlapping Both Preceding Colors


Signal Cable "B"
Interconnecting Cable "A"
1 1A 2 3 4 5 6A 6B 9
25 60 80 PC RB RA 10
Splice at Signal
*Source
1+
No. 1 Common for Red
No. 1A Common for Amber and Green
No. 23 Green Main Street, Red Cross Street
No. 45 Green Cross Street, Red Main Street
No. 6 All Amber
No. 9 Base Light, or Special Indications
No. 25 Emergency all Red Wire
No. 60 Flashing or Steady Amber Wire
No. 80 Shut Down Wire
PC Period Control Wire
PB Resynchronizing Wire "B"
RA Resynchronizing Wire "A"
No. 10 Common
1 1A 2 3 4 5 6A 6B 9
10 8 RA RB PC 80 60 25

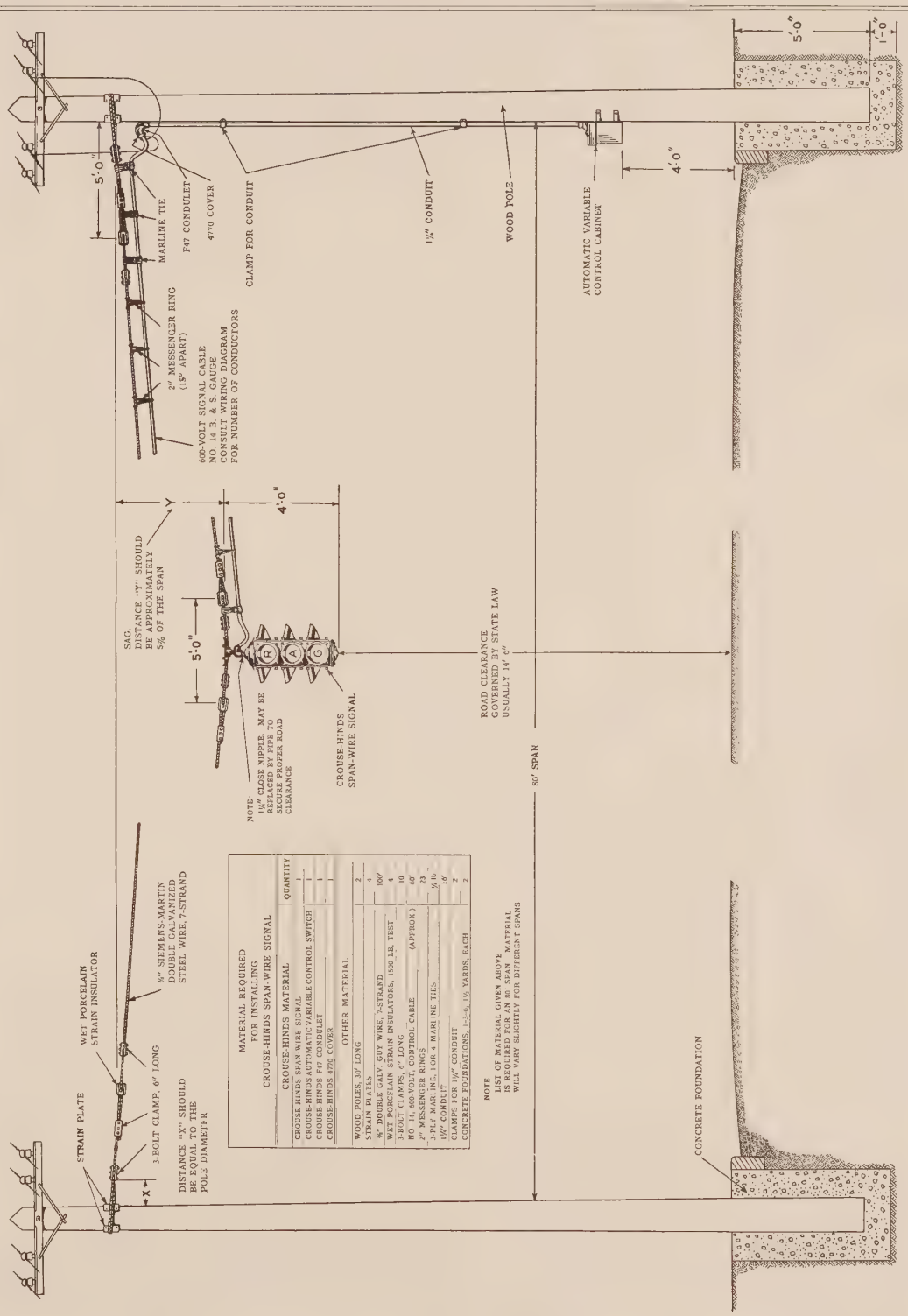
★When emergency all-red is not ordered, connect Signal lead No. 1A to conductor No. 1 at Signal
*For 220-Volt, connect both wires at current supply to 2-pole cartridge fuse cutout located on side wall of cabinet

Fig. 4
Field Wiring for Type DF-21 "Trafflex" Secondary
All-Amber Period Following Both Preceding Colors

CROUSE-HINDS

Span-Wire Signal Installation

Wood-Pole Mounting, Overhead Feed


5'-0"
1'-0"
4'-0"
5'-0"
MARLINE TIE
F47 CONDULET
4770 COVER
CLAMP FOR CONDUIT
1¼" CONDUIT
WOOD POLE
AUTOMATIC VARIABLE CONTROL CABINET
2" MESSENGER RING (18" APART)
600-VOLT SIGNAL CABLE NO. 14 B. & S. GAUGE CONDUCTOR WIRING DIAGRAM FOR NUMBER OF CONDUCTORS
SAG DISTANCE "Y" SHOULD BE APPROXIMATELY 5% OF THE SPAN
NOTE: 1¼" CLOSE NIPPLE MAY BE REPLACED BY PIPE TO SECURE PROPER ROAD CLEARANCE
CROUSE-HINDS SPAN-WIRE SIGNAL
ROAD CLEARANCE GOVERNED BY STATE LAW USUALLY 14' 6"
80' SPAN
WET PORCELAIN STRAIN INSULATOR
⅜" SIEMENS-MARTIN DOUBLE GALVANIZED STEEL WIRE, 7-STRAND
STRAIN PLATE
3-BOLT CLAMP, 6" LONG
DISTANCE "X" SHOULD BE EQUAL TO THE POLE DIAMETER
CONCRETE FOUNDATION

MATERIAL REQUIRED FOR INSTALLING CROUSE-HINDS SPAN-WIRE SIGNAL

CROUSE-HINDS MATERIAL	QUANTITY
CROUSE-HINDS SPAN-WIRE SIGNAL	1
CROUSE-HINDS AUTOMATIC VARIABLE CONTROL SWITCH	1
CROUSE-HINDS F47 CONDULET	1
CROUSE-HINDS 4770 COVER	1
OTHER MATERIAL	
WOOD POLES, 30' LONG	2
STRAIN PLATES	4
⅜" DOUBLE GALV. GUY WIRE, 7-STRAND	100'
WET PORCELAIN STRAIN INSULATORS, 1550 LB. TEST	4
3-BOLT CLAMPS, 6" LONG	10
NO 14, 600-VOLT, CONTROL CABLE (APPROX.)	60'
2" MESSENGER RINGS	23
3-PLY MARLINE, FOR 4 MARLINE TIES	½ lb.
1¼" CONDUIT	16'
CLAMPS FOR 1¼" CONDUIT	2
CONCRETE FOUNDATIONS, 1-2-4, 1½ YARDS, EACH	2

NOTE
LIST OF MATERIAL GIVEN ABOVE IS REQUIRED FOR AN 80' SPAN. MATERIAL WILL VARY SLIGHTLY FOR DIFFERENT SPANS

Fig. 1
Span-Wire Signal Installation
Wood-Pole Mounting

CROUSE-HINDS

Span-Wire Signal Installation

Steel-Pole Mounting, Underground Feed

MATERIAL REQUIRED FOR INSTALLING CROUSE-HINDS SPAN-WIRE SIGNAL

CROUSE-HINDS MATERIAL	QUANTITY
CROUSE-HINDS SPAN-WIRE SIGNAL	1
CROUSE-HINDS AUTOMATIC VARIABLE CONTROL SWITCH	1
CROUSE-HINDS F47 CONDULET	1
CROUSE-HINDS 4770 COVER	1

OTHER MATERIAL	
7-6-5" TUBULAR STEEL POLES, 30' LONG	2
7" GROUND SLEEVES, 2' LONG	2
5" POLE TOPS	2
5" POLE BANDS	8
¾" SIEMENS-MARTIN* GUY WIRE, 7-STRAND	100'
WET PORCELAIN STRAIN INSULATORS, 1500 LB TEST	4
¾" GUY THIMBLES	2
J-BOLT CLAMPS, 6" LONG	10
NO. 14, 600-VOLT, CONTROL CABLE (APPROX.)	80'
2" MESSENGER RINGS	23
3 PLY MARLINE, FOR ¾ MARLINE TIES	¼ lb
1¼" CONDUIT	¼ lb
CLAMPS FOR 1¼" CONDUIT	1
2" CONDUIT (APPROX.)	25'
2-COND., NO. 14, 600-VOLT, LEAD CABLE (APPROX.)	30'
CONCRETE FOUNDATIONS, 1-3-6, ¾ YARDS, EACH	2

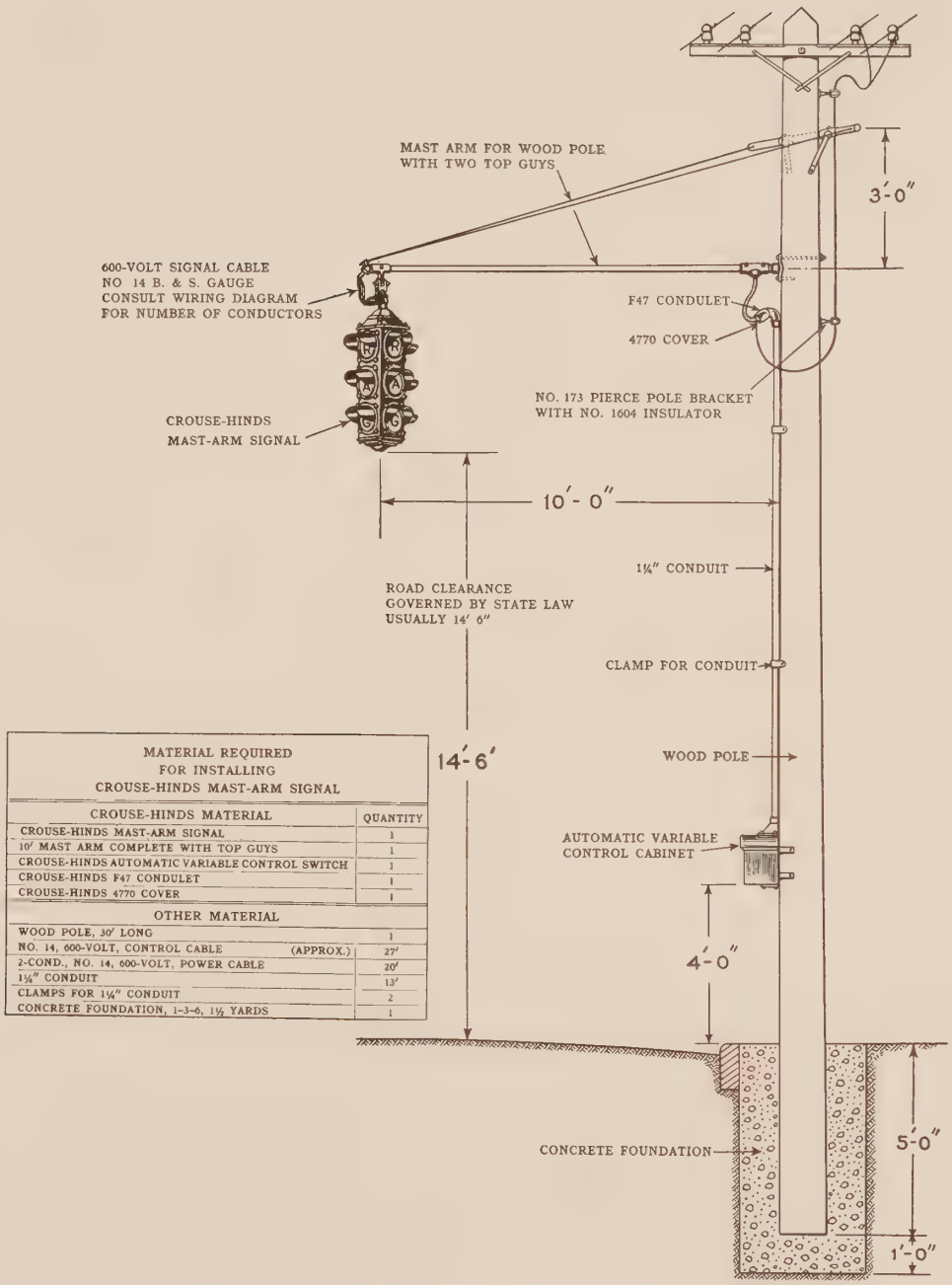
NOTE: LIST OF MATERIAL GIVEN ABOVE IS REQUIRED FOR AN 80' SPAN. MATERIAL WILL VARY SLIGHTLY FOR DIFFERENT SPANS

Fig. 2
Span-Wire Signal Installation
Steel-Pole Mounting

CROUSE-HINDS

Mast-Arm Signal Installation

Wood-Pole Mounting, Overhead Feed



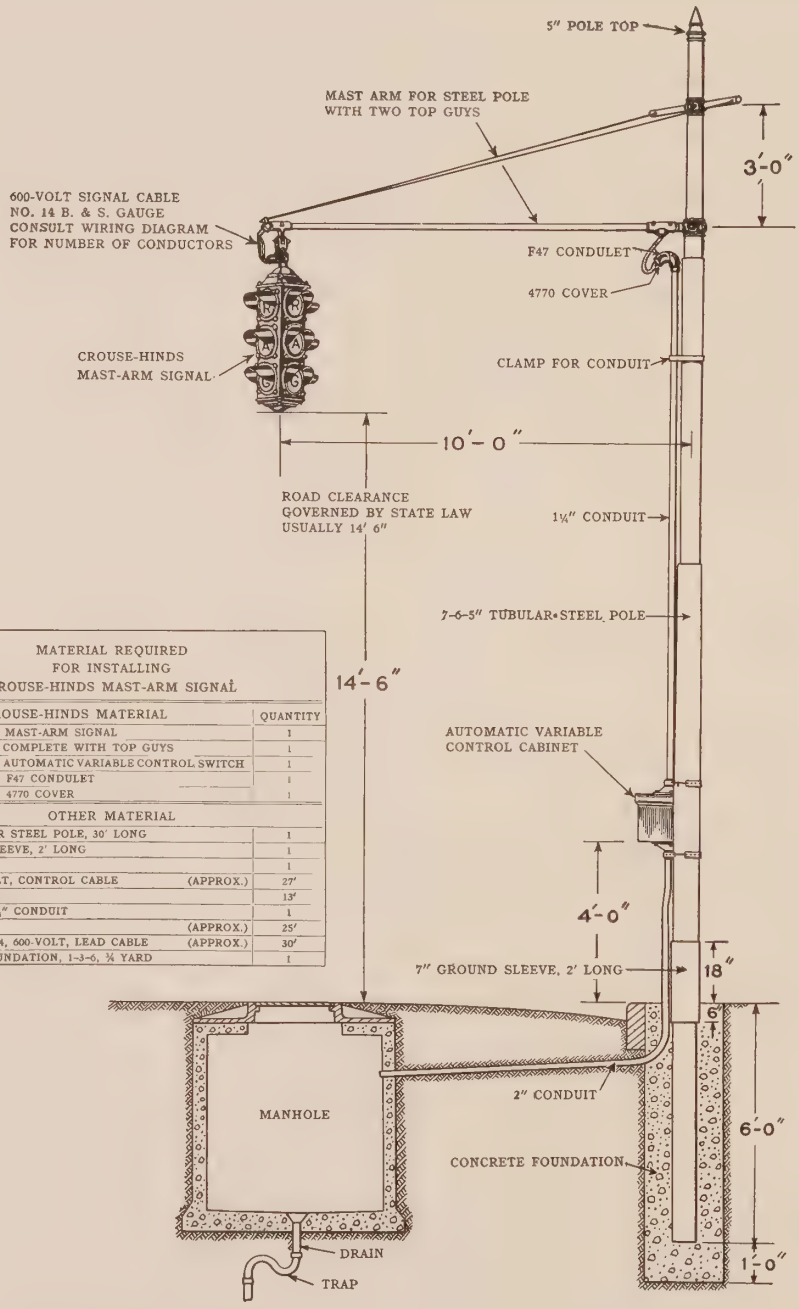
MATERIAL REQUIRED FOR INSTALLING CROUSE-HINDS MAST-ARM SIGNAL	
CROUSE-HINDS MATERIAL	**QUANTITY**
CROUSE-HINDS MAST-ARM SIGNAL	1
10′ MAST ARM COMPLETE WITH TOP GUYS	1
CROUSE-HINDS AUTOMATIC VARIABLE CONTROL SWITCH	1
CROUSE-HINDS F47 CONDULET	1
CROUSE-HINDS 4770 COVER	1
OTHER MATERIAL	
WOOD POLE, 30′ LONG	1
NO. 14, 600-VOLT, CONTROL CABLE (APPROX.)	27′
2-COND., NO. 14, 600-VOLT, POWER CABLE	20′
1¼″ CONDUIT	13′
CLAMPS FOR 1¼″ CONDUIT	2
CONCRETE FOUNDATION, 1–3–6, 1½ YARDS	1

Fig. 1
Mast-Arm Signal Installation
Wood-Pole Mounting

CROUSE-HINDS

Mast-Arm Signal Installation

Steel-Pole Mounting, Underground Feed



MATERIAL REQUIRED FOR INSTALLING CROUSE-HINDS MAST-ARM SIGNAL

CROUSE-HINDS MATERIAL		QUANTITY
CROUSE-HINDS MAST-ARM SIGNAL		1
10′ MAST ARM COMPLETE WITH TOP GUYS		1
CROUSE-HINDS AUTOMATIC VARIABLE CONTROL SWITCH		1
CROUSE-HINDS F47 CONDULET		1
CROUSE-HINDS 4770 COVER		1
OTHER MATERIAL		
7-6-5″ TUBULAR STEEL POLE, 30′ LONG		1
7″ GROUND SLEEVE, 2′ LONG		1
5″ POLE TOP		1
NO. 14, 600-VOLT, CONTROL CABLE	(APPROX.)	27′
1¼″ CONDUIT		13′
CLAMP FOR 1¼″ CONDUIT		1
2″ CONDUIT	(APPROX.)	25′
2-COND., NO. 14, 600-VOLT, LEAD CABLE	(APPROX.)	30′
CONCRETE FOUNDATION, 1-3-6, ¾ YARD		1

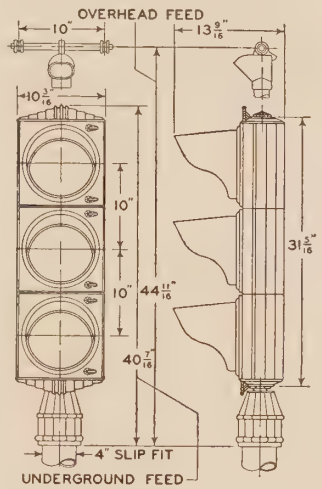
Fig. 2
Mast-Arm Signal Installation
Steel-Pole Mounting

CROUSE-HINDS

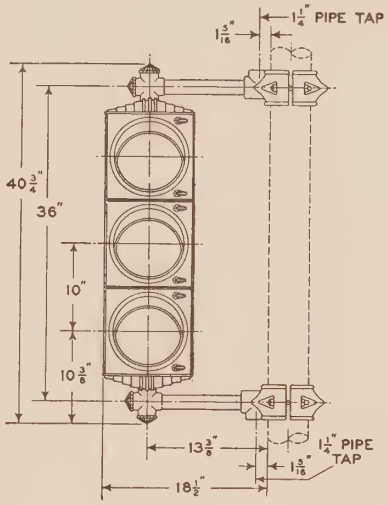
Dimensions

Types TSH, TSP, and TSV One-Way; and Type TRP Three-Section Adjustable Traffic Signals

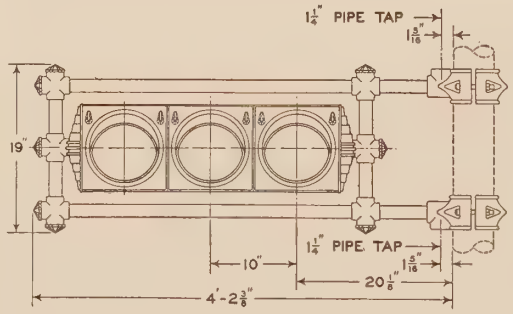
TYPE TSP
One-Way Signal—Post Mounting
Listed, section 601, page 10



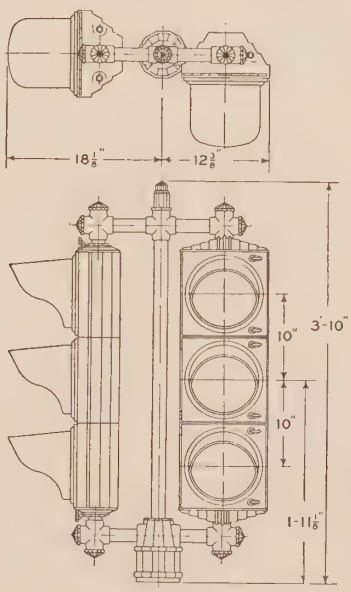
TYPE TSV
One-Way Signal—Vertical Bracket-Arm Mounting
Listed, section 601, page 10



TYPE TSH
One-Way Signal—Horizontal Bracket-Arm Mounting
Listed, section 601, page 10



TYPE TRP
Two-Way Signal—Post Mounting—Underground Feed
Listed, section 601, pages 11 to 16

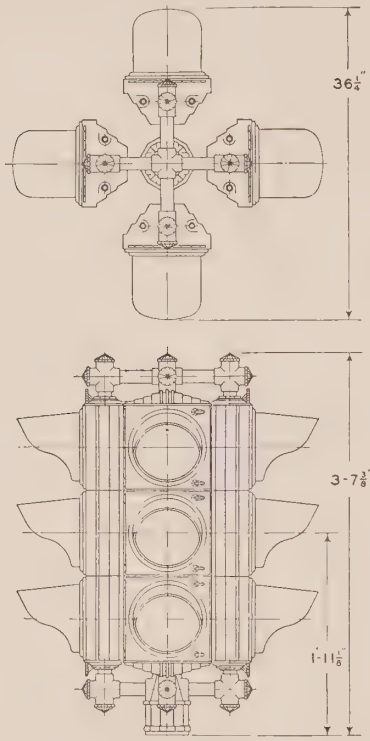


CROUSE-HINDS

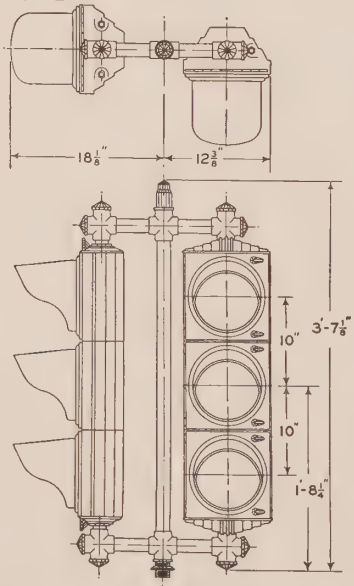
Dimensions

Types TIRP, TRP, TRU, and TTV Three-Section Adjustable Traffic Signals

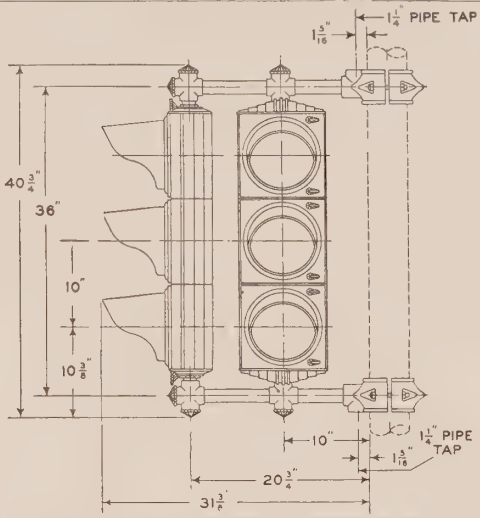
TYPE TRP
Four-Way Signal—Post Mounting—Underground Feed
Listed, section 601, pages 11 to 16



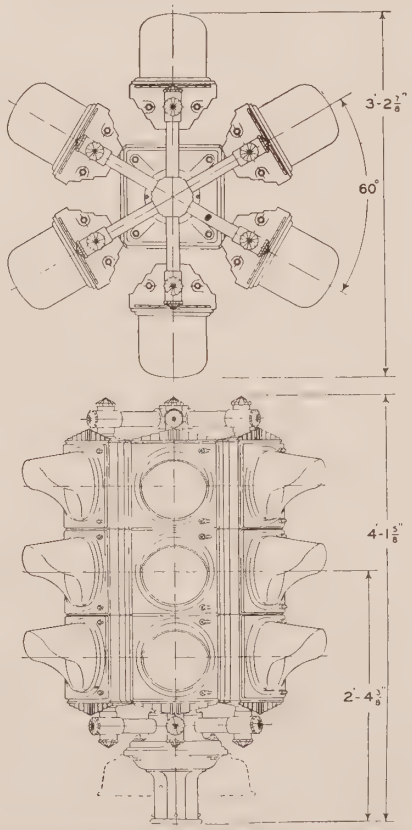
TYPE TRU
Two-Way Signal—Nipple Mounting—Underground Feed
Listed, section 601, pages 11 to 16



TYPE TTV
Two-Way Signal—Tandem Bracket-Arm Mounting
Listed, section 601, pages 11, 13, and 15



TYPES TRP AND TIRP
Six-Way Signal—Post Mounting—Underground Feed
Listed, section 601, pages 12, 14, and 16

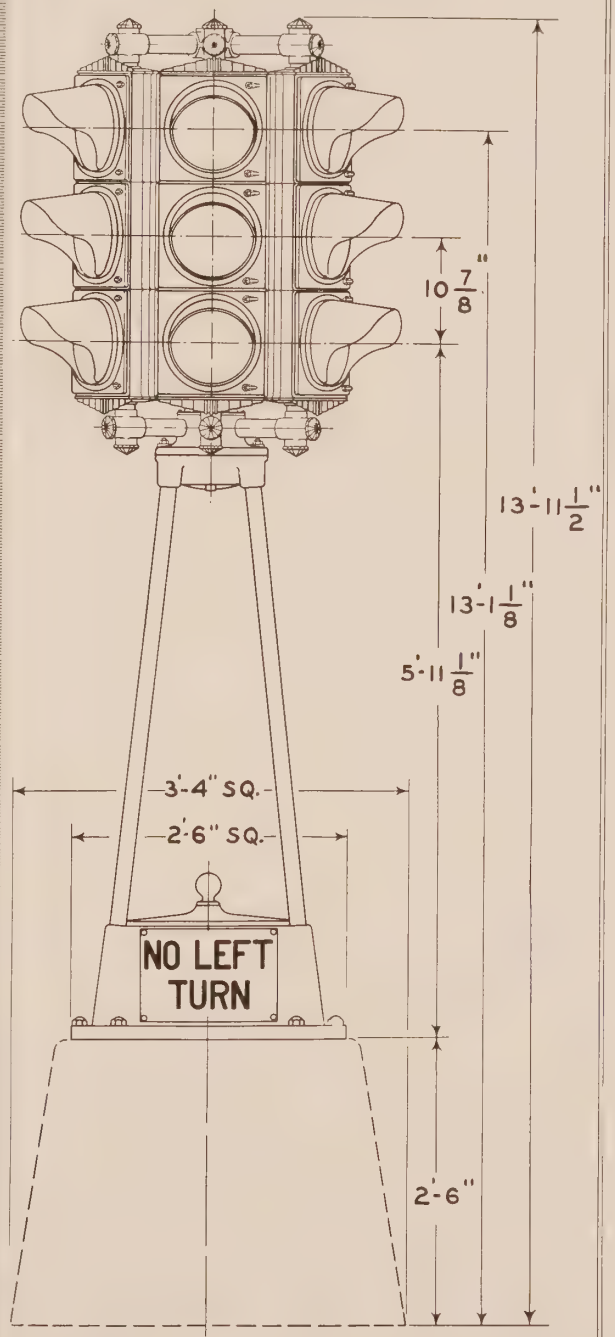


CROUSE-HINDS

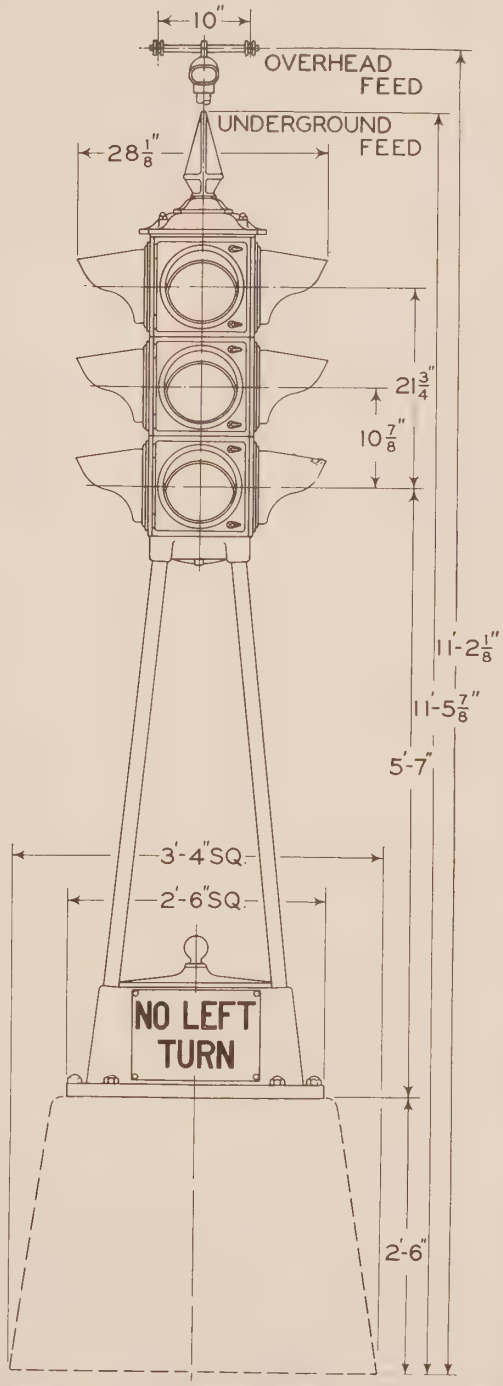
Dimensions

Types TRA and TSA Three-Section Traffic Signals

TYPE TRA
Six-Way Signal—Pedestal Mounting—Underground Feed With Base Light
Listed, section 601, pages 12, 14, and 16



TYPE TSA
Four-Way Signal—Pedestal Mounting With Base Light
Listed, section 601, pages 21 to 26



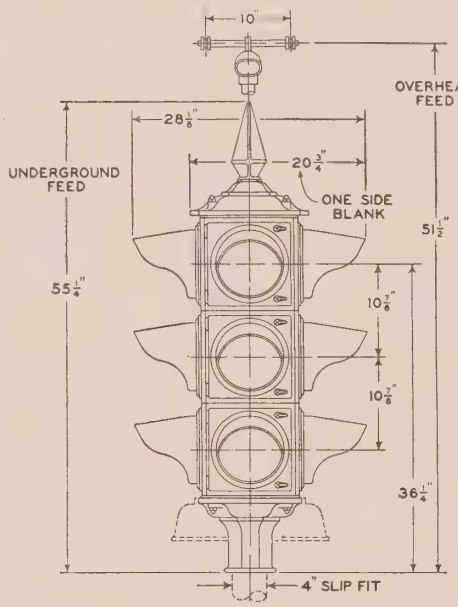
CROUSE-HINDS

Dimensions

Types TIM, TIP, TIW, TSM, TSP, TSV, and TSW Three-Section Non-Adjustable Traffic Signals

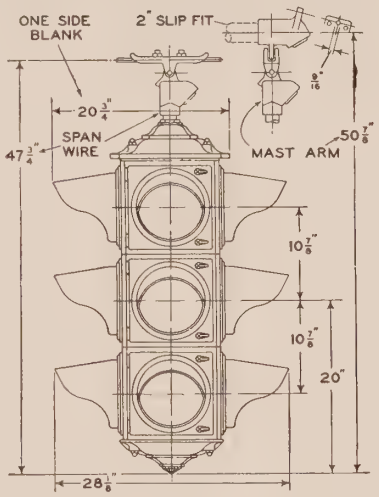
TYPES TSP AND TIP
Four-Way Signal—Post Mounting With and Without Base Light

Listed, section 601, pages 21 to 26



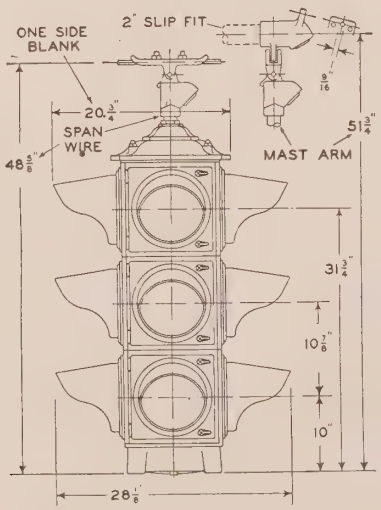
TYPES TSW AND TSM
Four-Way Signal—Span-Wire and Mast-Arm Mountings

Listed, section 601, pages 21 to 26



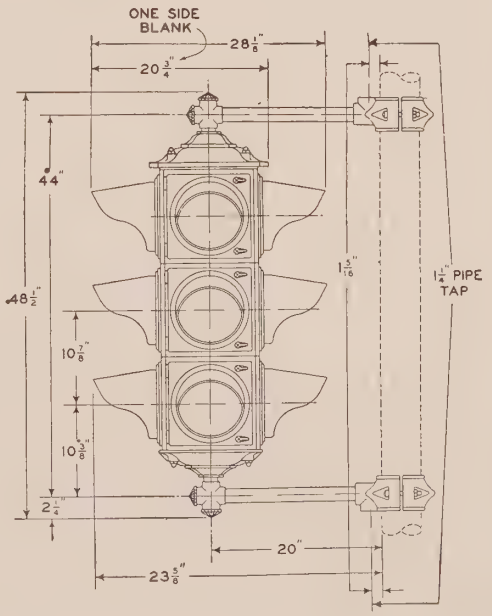
TYPES TIW AND TIM
Four-Way Signal—Span-Wire and Mast-Arm Mountings With Base Light

Listed, section 601, pages 21 to 26



TYPE TSV
Four-Way Signal—Vertical Bracket-Arm Mounting

Listed, section 601, pages 21 to 26



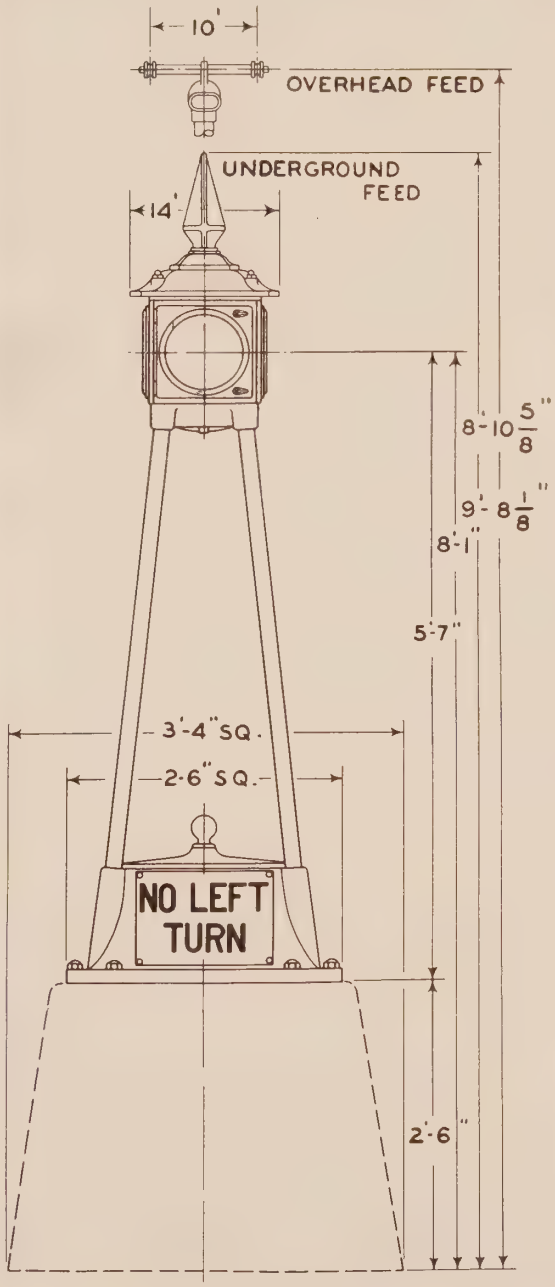
CROUSE-HINDS

Dimensions

Types TSA, TSM, TSMS, TST, TSW, and TSWS One-Section Non-Adjustable Beacons

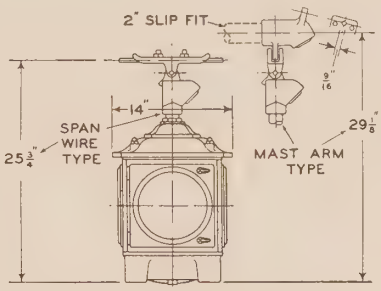
TYPE TSA
Four-Way Beacon—Pedestal Mounting With Base Light

Listed, section 602, page 2



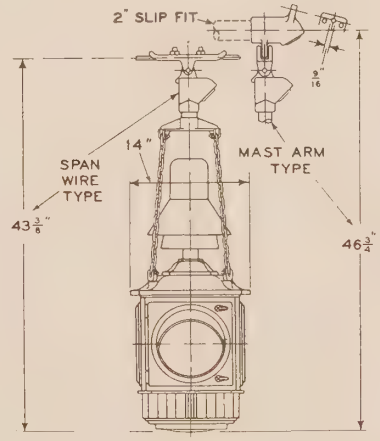
TYPES TSW AND TSM
Four-Way Beacon—Span-Wire and Mast-Arm Mountings With Base Light

Listed, section 602, page 2



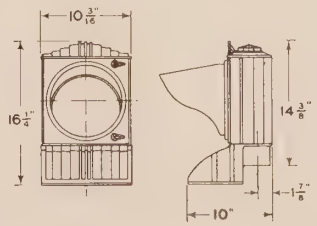
TYPES TSWS AND TSMS WITH SIREN•
Four-Way Beacon—Span-Wire and Mast-Arm Mountings With Base Light

Listed, section 602, page 2D



TYPE TST•
One-Way Beacon—Post Mounting With Sign Reflector

Listed, section 602, page 3



•Denotes addition.

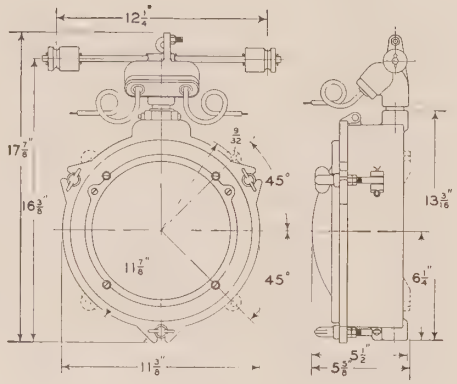
CROUSE-HINDS

Dimensions

Type ME-1 Emergency Switch; Types RM-111 and WVW Non-Adjustable Beacons; and TSS Controls

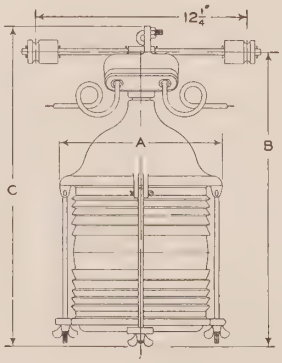
TYPE RM-111

Listed, section 602, page 4



TYPES WVW-6 AND WVW-8

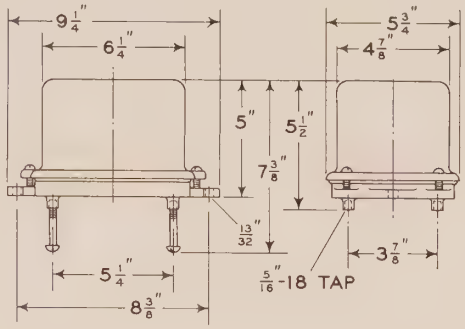
Listed, section 602, page 4



Type	Cat. No.	A	B	C
WVW-6	41598 41599	7 7	15 1/16 15 1/16	16 9/16 16 9/16
WVW-8	41665 41600	9⅜ 9⅜	17 17	18½ 18½

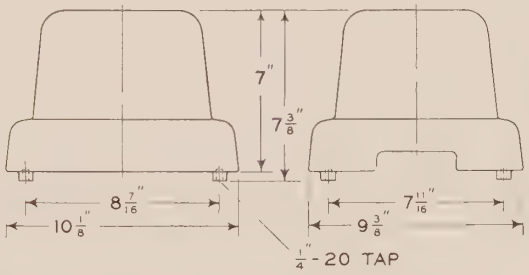
TYPE TSS-16, 550-WATT

Listed, section 602, page 5



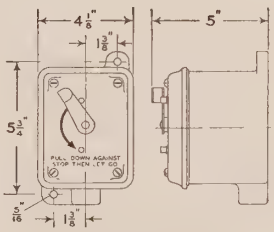
TYPE TSS-16, 2000-WATT

Listed, section 602, page 5



TYPE ME-1

Listed, section 602, page 7



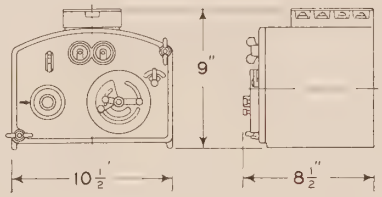
CROUSE-HINDS

Dimensions

Sizes 8, 11, 12, 18, 22, 26, 28, 118 and 218 Cabinets

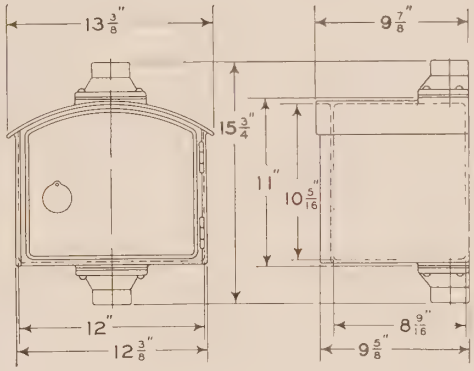
SIZE 8 CABINET

Listed, section 603, pages 4 to 6



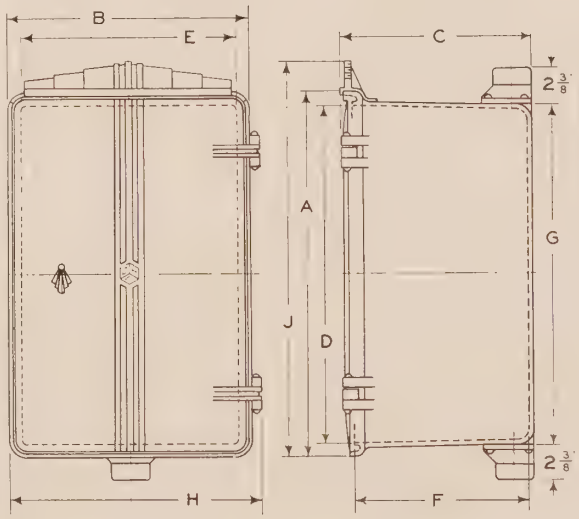
SIZE 11 CABINET

Listed, section 609, page 9



SIZES 12, 22, AND 28 CABINETS•

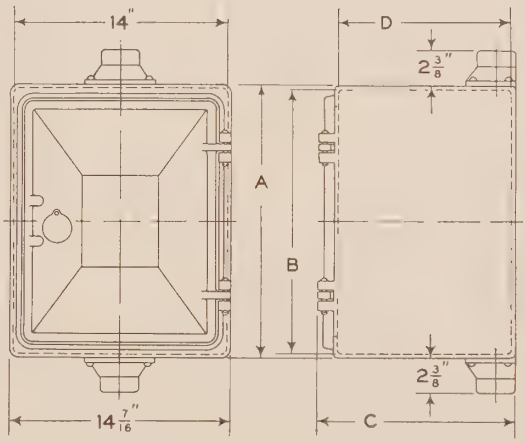
Listed, section 609, page 9



Size Cabinet	A	B	C	D	E	F	G	H	J
12	12 1/4	8 9/16	6 5/8	11	7 5/16	5 7/16	11 1/8	9 3/16	13 3/8
22	23 3/4	15 3/4	12 1/16	22	14	11 1/4	22 1/16	16 3/8	25 11/16
28	29 3/4	15 3/4	12 1/16	28	14	11 1/4	28 1/16	16 3/8	31 11/16

SIZES 18, 26, 118, AND 218 CABINETS

Listed, section 609, page 9



Size Cabinet	A	B	C	D
18	17 1/16	17 1/4	10 13/16	9 1/4
26	25 15/16	25 1/2	12 13/16	11 1/4
118	17 1/16	17 1/4	12 13/16	11 1/4
218•	17 1/16	17 1/4	15 9/16	14

•Denotes addition.

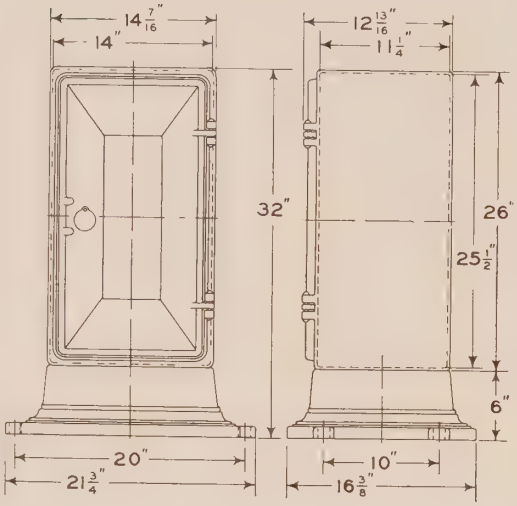
CROUSE-HINDS

Dimensions

Size 26 Meter Cabinet; and Type SM-3 Synchromaster

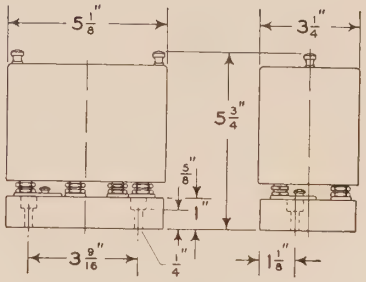
SIZE 26 METER CABINET

Listed, section 609, page 9



TYPE SM-3

Listed, section 604, page 9



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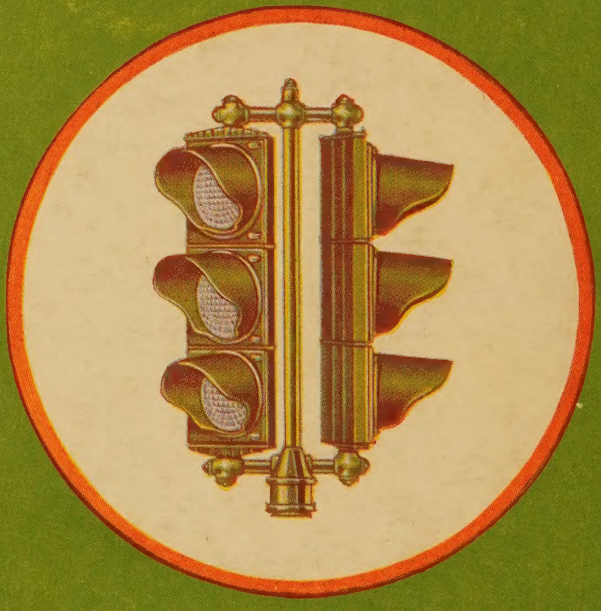
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KL477	Relay	608	12
KL478	Slip Fitter	610	4
KL479	Lens, Wait	608	2
KL480	Lens, Straight Through Arrow	608	2
KL491	Lens, Right Arrow	608	2
KL1099	Lens, Left	608	2
KL1100	Lens, Straight Through Arrow	608	2
KL1716	Pipe Arm Assembly	610	13
KL1731	Sign, Stop Then Go	608	8
KL1757	Sign Holder	608	7
KL1765	Sign Holder	608	7
KL1791	Sign, Stop Then Go	608	8
KL1792	Pipe Arm Assembly	610	13
KL1793	Pipe Arm Assembly	610	13
KL1794	Pipe Arm Assembly	610	13
KL1795	Pipe Arm Assembly	610	13
KL1796	Pipe Arm Assembly	610	13
KL1797	Gasket	608	13
KL1799	Sign, Caution	608	8
KL2406	Lens, Walk	608	2
KL2428	Pole Plate	608	5
KL3132	Pole Clamp	608	5
KL3134	Pole Clamp	608	5
KL3135	Pole Clamp	608	5
KL3136	Pole Clamp	608	5
KL3137	Pole Clamp	608	5
KL3138	Pole Clamp	608	5
KL3139	Pole Clamp	608	5
KL3140	Pole Clamp	608	5
KL3141	Pole Clamp	608	5
KL3169	Mast Arm	608	3
KL3170	Mast Arm	608	3
KL3171	Mast Arm	608	3
KL3172	Mast Arm	608	3
KL3173	Mast Arm	608	3
KL3174	Mast Arm	608	3
KL3175	Mast Arm	608	3
KL3176	Mast Arm	608	3
KL3401	Pole Bracket	608	5
KL3402	Pedestal Adapter	608	5
KL3403	Pedestal Adapter	608	5
KL3404	Pole Strap	608	5
KL3405	Pole Strap	608	5
KL3406	Pole Strap	608	5
YYAP81S	Hub Plate	608	13
YYAP82S	Hub Plate	608	13
YYAP83S	Hub Plate	608	13
YYAP84S	Hub Plate	608	13
YYAP85S	Hub Plate	608	13
YYAP86S	Hub Plate	608	13
YYLP81S	Hub Plate	608	13
YYLP82S	Hub Plate	608	13
YYLP83S	Hub Plate	608	13
YYLP84S	Hub Plate	608	13
YYLP85S	Hub Plate	608	13
YYLP86S	Hub Plate	608	13
YYP81S	Hub Plate	608	13
YYP82S	Hub Plate	608	13
YYP83S	Hub Plate	608	13
YYP84S	Hub Plate	608	13
YYP85S	Hub Plate	608	13
YYP86S	Hub Plate	608	13
YYP87S	Hub Plate	608	13
YYP800S	Hub Plate	608	13
YYP801S	Hub Plate	608	13
YYP811S	Hub Plate	608	13
YYP822S	Hub Plate	608	13
YYP833S	Hub Plate	608	13
YYP844S	Hub Plate	608	13